Direct Testimony and Schedules
James H. Vander Weide, Ph.D.

Before the North Dakota Public Service Commission
State of North Dakota

In the Matter of the Application of
Northern States Power Company, a Minnesota Corporation

For Authority to Increase Rates for
Electric Service in North Dakota

Case No. PU-07-____
Exhibit ___

Return on Equity

December 7, 2007

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I. INTRODUCTION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME, TITLE, AND BUSINESS ADDRESS.

A. My name is James H. Vander Weide. I am Research Professor of Finance and Economics at Duke University, the Fuqua School of Business. I am also President of Financial Strategy Associates, a firm that provides strategic and financial consulting services to business clients. My business address is 3606 Stoneybrook Drive, Durham, North Carolina.

Q. PLEASE SUMMARIZE YOUR QUALIFICATIONS.

A. I received a Bachelor's Degree in Economics from Cornell University and a Ph.D. in Finance from Northwestern University. After joining the faculty of the School of Business at Duke University, I was named Assistant Professor, Associate Professor, and then Professor. I have published research in the areas of finance and economics, taught courses in these fields at Duke over the last 35 years, and currently serve as Academic Program Director for its Advanced Management Program.

Q. HAVE YOU PREVIOUSLY TESTIFIED ON FINANCIAL OR ECONOMIC ISSUES?

A. Yes. As an expert on financial and economic theory and practice, I have participated in more than 370 regulatory and legal proceedings before the U.S. Congress, the Canadian Radio-Television and Telecommunications Commission, the Federal Communications Commission, the National Telecommunications and Information Administration, the Federal Energy Regulatory Commission, the public service commissions of 40 states, the insurance commissions of five states, the Iowa State Board of Tax Review, the National Association of Securities Dealers, and the North Carolina Property Tax Commission. In addition, I have testified as an expert witness

in proceedings before the U.S. District Court for the District of Nebraska; the U.S. District Court for the District of New Hampshire; the U.S. District Court for the Eastern District of North Carolina; the U.S. District Court for the Northern District of California; the Superior Court, North Carolina; the U.S. Bankruptcy Court for the Southern District of West Virginia; and the U. S. District Court for the Eastern District of Michigan. My resume is shown in Exhibit__(JVW-1) Appendix 1.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. I have been asked by Northern States Power Company, a Minnesota corporation ("Xcel Energy" or the "Company") operating in North Dakota to prepare an independent appraisal of Xcel Energy's cost of equity, and to recommend to the North Dakota Public Service Commission ("the Commission") a rate of return on equity ("ROE") for the purpose of ratemaking.

II. SUMMARY OF TESTIMONY

Q. HOW DID YOU ESTIMATE XCEL ENERGY'S COST OF EQUITY?

A. I estimated Xcel Energy's cost of equity by applying several standard cost of equity estimation techniques, including the discounted cash flow ("DCF") model, the risk premium method, and the Capital Asset Pricing Model ("CAPM") to a large group of comparable companies.

Q. WHY DID YOU APPLY YOUR COST OF EQUITY METHODS TO A LARGE GROUP OF COMPARABLE COMPANIES RATHER THAN SOLELY TO XCEL ENERGY?

A. I applied my cost of equity methods to a large group of comparable companies because standard cost of equity methodologies such as the DCF,

risk premium, and CAPM require inputs of quantities that are not easily measured. Since these inputs can only be estimated, there is naturally some degree of uncertainty surrounding the estimate of the cost of equity for each company. However, the effect of the uncertainty in the estimate of the cost of equity for an individual company can be greatly reduced by applying cost of equity methodologies to a large sample of comparable companies. Intuitively, unusually high estimates for some individual companies are offset by unusually low estimates for other individual companies. Thus, financial economists invariably apply cost of equity methodologies to a group of comparable companies. In utility regulation, the practice of using a group of comparable companies is further supported by the United States Supreme Court standard that the utility should be allowed to earn a return on its investment that is commensurate with returns being earned on other investments of similar risk.[1]

Q. WHAT COST OF EQUITY DO YOU FIND FOR YOUR COMPARABLE COMPANIES IN THIS PROCEEDING?

A. On the basis of my studies, and as summarized in the table below, I find that the cost of equity for my comparable companies is equal to 11.7 percent.

TABLE 1

COST OF EQUITY MODEL RESULTS

Method	Cost of Equity
Discounted Cash Flow	11.6%
Risk Premium	11.2%
CAPM	12.3%
Average	11.7%

1 See *Bluefield Water Works and Improvement Co. v. Public Service Comm'n.* 262 U.S. 679, 692 (1923) and *Hope Natural Gas Co.*, 320 U.S., 591, 603 (1944).

Q. WHAT IS YOUR RECOMMENDATION REGARDING XCEL ENERGY' ALLOWED ROE?

A. I conservatively recommend that Xcel Energy be allowed an ROE of 11.5 percent.

Q. WHY IS YOUR RECOMMENDED ROE CONSERVATIVE?

A. My recommended ROE is conservative because it is below the average of the results for my DCF, risk premium, and CAPM models and is also below the results of my DCF analysis. Further, the financial risk of my comparable companies, which is based on the equity ratio resulting from the market values of their equity and debt, is less than the financial risk implied by the lower equity ratio in Xcel Energy's ratemaking capital structure, which is based on its book values of equity and debt.

Q. DO YOU HAVE EXHIBITS ACCOMPANYING YOUR TESTIMONY?

A. Yes. I have prepared or supervised the preparation of nine schedules and four appendices that accompany my testimony.

III. ECONOMIC AND LEGAL PRINCIPLES

Q. HOW DO ECONOMISTS DEFINE THE REQUIRED RATE OF RETURN, OR COST OF CAPITAL, ASSOCIATED WITH PARTICULAR INVESTMENT DECISIONS?

A. Economists define the cost of capital as the return investors expect to receive on alternative investments of comparable risk.

Q. HOW DOES THE COST OF CAPITAL AFFECT A FIRM'S INVESTMENT DECISIONS?

A. The goal of a firm is to maximize the value of the firm. This goal can be accomplished by accepting all investments in plant and equipment with an expected rate of return greater than or equal to the cost of capital. Thus, a

firm should continue to invest in plant and equipment only so long as the return on its investment is greater than or equal to its cost of capital.

Q. HOW DOES THE COST OF CAPITAL AFFECT INVESTORS' WILLINGNESS TO INVEST IN A COMPANY?

A. The cost of capital measures the return investors can expect on investments of comparable risk. The cost of capital also measures the investor's required rate of return on investment because rational investors will not invest in a particular investment opportunity if the expected return on that opportunity is less than the cost of capital. Thus, the cost of capital is a hurdle rate for both investors and the firm.

Q. DO ALL INVESTORS HAVE THE SAME POSITION IN THE FIRM?

A. No. Debt investors have a fixed claim on a firm's assets and income that must be paid prior to any payment to the firm's equity investors. Since the firm's equity investors have a residual claim on the firm's assets and income, equity investments are riskier than debt investments. Thus, the cost of equity exceeds the cost of debt.

Q. WHAT IS THE OVERALL OR AVERAGE COST OF CAPITAL?

A. The overall or average cost of capital is a weighted average of the cost of debt and cost of equity, where the weights are the percentages of debt and equity in a firm's capital structure.

Q. CAN YOU ILLUSTRATE THE CALCULATION OF THE OVERALL OR WEIGHTED AVERAGE COST OF CAPITAL?

A. Yes. Assume that the cost of debt is 7 percent, the cost of equity is 13 percent, and the percentages of debt and equity in the firm's capital structure are 50 percent and 50 percent, respectively. Then the weighted

average cost of capital is expressed by .50 times 7 percent (3.5 percent) plus .50 times 13 percent (6.5 percent), or 10.0 percent.

Q. HOW DO ECONOMISTS DEFINE THE COST OF EQUITY?

A. Economists define the cost of equity as the return investors expect to receive on alternative equity investments of comparable risk. Since the return on an equity investment of comparable risk is not a contractual return, the cost of equity is more difficult to measure than the cost of debt. However, as I have already noted, there is agreement among economists that the cost of equity is greater than the cost of debt. There is also agreement among economists that the cost of equity, like the cost of debt, is both forward looking and market based.

Q. HOW DO ECONOMISTS MEASURE THE PERCENTAGES OF DEBT AND EQUITY IN A FIRM'S CAPITAL STRUCTURE?

A. Economists measure the percentages of debt and equity in a firm's capital structure based on market values, rather than book values, including calculation of the market value of the firm's debt and the market value of its equity. Economists then calculate the percentage of debt by the ratio of the market value of debt to the combined market value of debt and equity, and the percentage of equity by the ratio of the market value of equity to the combined market values of debt and equity. For example, if a firm's debt has a market value of $25 million and its equity has a market value of $75 million, then its total market capitalization is $100 million, and its capital structure contains 25 percent debt and 75 percent equity.

Q. WHY DO ECONOMISTS MEASURE A FIRM'S CAPITAL STRUCTURE IN TERMS OF THE MARKET VALUES OF ITS DEBT AND EQUITY?

A. Economists measure a firm's capital structure in terms of the market values of its debt and equity because: (1) the weighted average cost of capital is defined as the return investors expect to earn on a portfolio of the company's debt and equity securities; (2) investors measure the expected return on a portfolio of securities using market value weights, not book value weights; and (3) market values are the best measures of the amounts of debt and equity investors have invested in the company on a going forward basis.

Q. WHY DO INVESTORS MEASURE THE EXPECTED RETURN ON THEIR INVESTMENT PORTFOLIOS USING MARKET VALUE WEIGHTS RATHER THAN BOOK VALUE WEIGHTS?

A. Investors measure the expected return on their investment portfolios using market value weights because: (1) the expected return on a portfolio is calculated by comparing the expected value of the portfolio at the end of the investment period to its current value; and (2) market values are the best measure of the current value of the portfolio. From the investor's point of view, the historical cost, or book value of their investment, is generally a poor indicator of the portfolio's current value.

Q. IS THE ECONOMIC DEFINITION OF THE WEIGHTED AVERAGE COST OF CAPITAL CONSISTENT WITH THE TRADITIONAL REGULATORY DEFINITION OF THE AVERAGE COST OF CAPITAL?

A. No. The economic definition of the weighted average cost of capital is based on the market costs of debt and equity, the market value percentages of debt and equity in a company's capital structure, and the future expected risk of investing in the company. In contrast, the traditional regulatory

definition of the weighted average cost of capital uses the embedded cost of debt and the book values of debt and equity in a company's capital structure.

Q. DOES THE REQUIRED RATE OF RETURN ON AN INVESTMENT VARY WITH THE RISK OF THAT INVESTMENT?

A. Yes. Since investors are averse to risk, they require a higher rate of return on investments with greater risk.

Q. HAS RISK BEEN RECOGNIZED AS A KEY CONSDIERATION IN DETERMINING THE ROE OF A REGULATED FIRM?

A. Yes. The significance of risk is recognized in two United States Supreme Court cases: (1) *Bluefield Water Works and Improvement Co. v. Public Service Comm'n*; and (2) *Federal Power Comm'n v. Hope Natural Gas Co.* In the *Bluefield Water Works* case, the Court stated:

> A public utility is entitled to such rates as will permit it to earn a return upon the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility, and should be adequate, under efficient and economical management, to maintain and support its credit, and enable it to raise the money necessary for the proper discharge of its public duties.[2]

The Court clearly recognizes here that: (1) a regulated firm cannot remain financially sound unless the return it is allowed to earn on the value of its property is at least equal to the cost of capital (the principle relating to the

[2] *Bluefield Water Works and Improvement Co. v. Public Service Comm'n,* 262 U.S. 679, 692 (1923).

demand for capital); and (2) a regulated firm will not be able to attract capital if it does not offer investors an opportunity to earn a return on their investment equal to the return they expect to earn on other investments of the same risk (the principle relating to the supply of capital).

In the *Hope Natural Gas* case, the Court reiterates the financial soundness and capital attraction principles of the *Bluefield* case:

> From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock... By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.[3]

The Court clearly recognizes that the fair rate of return on equity should be: (1) comparable to returns investors expect to earn on other investments of similar risk; (2) sufficient to assure confidence in the company's financial integrity; and (3) adequate to maintain and support the company's credit and to attract capital.

[3] *Federal Power Comm'n v. Hope Natural Gas Co.,* 320 U.S. 591, 603 (1944).

IV. BUSINESS AND FINANCIAL RISKS IN THE ELECTRIC ENERGY BUSINESS

Q. WHAT ARE THE PRIMARY BUSINESS AND FINANCIAL RISKS FACING ELECTRIC ENERGY COMPANIES SUCH AS XCEL ENERGY?

A. The business and financial risks of investing in electric energy companies such as Xcel Energy include:

1. Demand Uncertainty. Demand uncertainty is one of the primary business risks of investing in electric energy companies such as Xcel Energy. Demand uncertainty is caused by: (a) the strong dependence of electric demand on the state of the economy and weather patterns; (b) sensitivity of demand to changes in rates; (c) the ability of customers to choose alternative forms of energy, such as natural gas or oil; (d) the ability of some customers to locate facilities in the service areas of competitors; (e) the ability of some customers to conserve energy or produce their own electricity under cogeneration or self-generation arrangements; and (f) the ability of municipalities to go into the energy business. Demand uncertainty is a problem for electric companies because of the need to plan for infrastructure additions many years in advance of demand

2. Operating Expense Uncertainty. The business risk of electric energy companies is also increased by the inherent uncertainty in the typical electric energy company's operating expenses. Operating expense uncertainty arises as a result of: (a) high volatility in fuel prices or interruptions in fuel supply; (b) the prospect of increasing employee health care and pension expenses; (c) uncertainty over plant outages, the cost of purchased power, and the revenues achieved from off system sales; (d) variability in maintenance costs and the costs of other materials; (e) uncertainty over outages of the transmission and distribution systems, as

well as storm-related expenses; and (f) the prospect of increased expenses for security.

3. Investment Cost Uncertainty. The electric energy business requires very large investments in the generation, transmission, and distribution facilities required to deliver energy to customers. The future amounts of required investments in these facilities are highly uncertain as a result of: (a) demand uncertainty; (b) the changing economics of alternative generation technologies; (c) uncertainty in environmental regulations and clean air requirements; (d) uncertainty in the costs of construction materials and labor; (e) uncertainty in the amount of additional investments to insure the reliability of the company's transmission and distribution networks; (f) uncertainty regarding the regulatory and management structure of the electric transmission network; and (g) uncertainty regarding future decommissioning costs. Furthermore, the risk of investing in electric energy facilities is increased by the irreversible nature of the company's investments in generation, transmission, and distribution facilities.

4. High Operating Leverage. The electric energy business requires a large commitment to fixed costs in relation to the operating margin on sales, a situation known as high operating leverage. The relatively high degree of fixed costs in the electric energy business arises from the average electric energy company's large investment in fixed generation, transmission, and distribution facilities. High operating leverage causes the average electric energy company's operating income to be highly sensitive to revenue fluctuations.

5. Financial Leverage. The capital structures of electric utilities include higher percentages of debt compared to non-utility firms. High debt leverage is a source of additional risk to utility stock investors because it

increases the percentage of the firm's costs that are fixed. The use of financial leverage also reduces the firm's interest coverage and increases vulnerability to variations in revenues.

6. Regulatory Uncertainty. Investors' perceptions of the business and financial risks of electric energy companies are strongly influenced by their views of the quality of regulation. Investors are aware that the earnings and business operations of electric utilities are significantly influenced by regulation in the jurisdictions in which the utilities operate. The decisions of regulatory entities have a direct impact on the ability of utilities to recover their cost of service and earn a fair and reasonable return on investment.

Q. HAVE ANY OF THESE RISK FACTORS CHANGED IN RECENT YEARS?

A. Yes. In recent years, the risk of investing in electric energy companies has increased as a result of significantly greater volatility in fuel prices; greater uncertainty in the cost of satisfying environmental requirements; increased competition in the industry; more volatile purchased power and off system sales prices; and greater uncertainty in the expenses associated with system outages, storm damage, and security. These risks are exacerbated by the prospect that the typical electric utility will need to make significant investments in new base load generation facilities over the next ten years. The Commission should recognize these higher risks and the correspondingly higher returns required by investors in setting Xcel Energy's allowed ROE in this proceeding.

V. COST OF EQUITY ESTIMATION METHODS

Q. WHAT METHODS DID YOU USE TO ESTIMATE XCEL ENERGY'S ROE?

A. I used three generally accepted methods to estimate Xcel Energy's ROE. As noted above, they are the DCF, risk premium, and CAPM methods. The DCF method assumes that the current market price of a firm's stock is equal to the discounted value of all expected future cash flows. The risk premium method assumes that the investor's required return on an equity investment is equal to the interest rate on a long-term bond, plus an additional equity risk premium to compensate the investor for the added risks of investing in equities compared to bonds. The CAPM assumes that the investor's required rate of return on equity is equal to a risk-free rate of interest, plus the product of a company-specific risk factor, beta, and the expected risk premium on the market portfolio.

A. Discounted Cash Flow Method

Q. PLEASE DESCRIBE THE DCF MODEL.

A. The DCF model is based on the fundamental principle that investors value an asset on the basis of the future cash flows they expect to receive from owning the asset. Thus, investors value an investment in a bond because they expect to receive a sequence of semi-annual coupon payments over the life of the bond and a terminal payment equal to the bond's face value at the time the bond matures. Likewise, investors value an investment in a firm's stock because they expect to receive a sequence of dividend payments and, perhaps, expect to sell the stock at a higher price sometime in the future.

A second fundamental principle of the DCF method is that investors value a dollar received in the future less than a dollar received today. A future dollar

is valued less than a current dollar because investors could invest a current dollar in an interest earning account and increase their wealth. This principle is called the time value of money.

Applying the two fundamental DCF principles noted above to an investment in a bond leads to the conclusion that investors value their investment in the bond on the basis of the present value of the bond's future cash flows. Thus, the price of the bond should be equal to:

EQUATION 1

$$P_B = \frac{C}{(1+i)} + \frac{C}{(1+i)^2} + \ldots + \frac{C+F}{(1+i)^n}$$

where:

P_B	=	Bond price;
C	=	Cash value of the coupon payment (assumed for notational convenience to occur annually rather than semi-annually);
F	=	Face value of the bond;
i	=	The rate of interest the investor could earn by investing his money in an alternative bond of equal risk; and
n	=	The number of periods before the bond matures.

Applying these same principles to an investment in a firm's stock suggests that the price of the stock should be equal to:

EQUATION 2

$$P_s = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_n + P_n}{(1+k)^n}$$

where:

P_S = Current price of the firm's stock;
$D_1, D_2...D_n$ = Expected annual dividend per share on the firm's stock;
P_n = Price per share of stock at the time the investor expects to sell the stock; and
k = Return the investor expects to earn on alternative investments of the same risk, i.e., the investor's required rate of return.

Equation (2) is frequently called the "annual" discounted cash flow model of stock valuation. The annual DCF model rests on the assumption that dividends are paid annually at the end of the year. Assuming that dividends grow at a constant annual rate, g, this equation can be solved for k, the cost of equity. The resulting cost of equity equation is $k = D_1/P_s + g$, where k is the cost of equity, D_1 is the expected next period annual dividend, Ps is the current price of the stock, and g is the constant annual growth rate in earnings, dividends, and book value per share. The term D_1/P_s is called the dividend yield component of the annual DCF model, and the term g is called the growth component of the annual DCF model.

Q. ARE YOU RECOMMENDING THAT THE ANNUAL DCF MODEL BE USED TO ESTIMATE XCEL ENERGY'S COST OF EQUITY?

A. No. The annual DCF model is only a correct expression of the present value of future dividends if dividends are paid annually at the end of each year. Since the companies in my proxy group all pay dividends quarterly, the current market price that investors are willing to pay reflects the expected quarterly receipt of dividends. Therefore, a quarterly DCF model should be used to estimate the cost of equity for these firms. The quarterly DCF model differs from the annual DCF model in that it expresses a company's price as the present value of a quarterly stream of dividend payments. A

complete analysis of the implications of the quarterly payment of dividends on the DCF model is provided in Appendix 2. For the reasons cited there, I employed the quarterly DCF model throughout my calculations.

Q. PLEASE DESCRIBE THE QUARTERLY DCF MODEL YOU USED.

A. The quarterly DCF model I used is described on Exhibit___(JVW-1) Schedule 1 and in Exhibit___(JVW-1) Appendix 2. The quarterly DCF equation shows that the cost of equity is: the sum of the future expected dividend yield and the growth rate, where the dividend in the dividend yield is the equivalent future value of the four quarterly dividends at the end of the year, and the growth rate is the expected growth in dividends or earnings per share.

Q. HOW DID YOU ESTIMATE THE DIVIDEND PAYMENTS?

A. The quarterly DCF model requires an estimate of the dividends, d_1, d_2, d_3, and d_4 that investors expect to receive over the next four quarters. I estimated the next four quarterly dividends by multiplying the previous four quarterly dividends by the factor, (1 + the growth rate, g).

Q. CAN YOU ILLUSTRATE HOW YOU ESTIMATED THE NEXT FOUR QUARTERLY DIVIDENDS WITH DATA FOR A SPECIFIC COMPANY?

A. Yes. In the case of Ameren, the first company shown in Exhibit___(JVW 1) Schedule 1, the last four quarterly dividends are equal to 0.288, 0.318, 0.318, and 0.318. The growth rate for Alliant Energy is 5.67 percent, as shown on Exhibit___(JVW 1) Schedule 1. Thus dividends, d_1, d_2, d_3, and d_4 are equal to 0.304 and 0.336 [0.288 x (1 + .0567) = 0.304] and [0.318 x (1 + .0567) = 0.336]. (As noted previously, the logic underlying this procedure is described in Exhibit___(JVW-1) Appendix 2.)

Q. HOW DID YOU ESTIMATE THE GROWTH COMPONENT OF THE QUARTERLY DCF MODEL?

A. I used the analysts' estimates of future earnings per share ("EPS") growth reported by I/B/E/S Thomson Financial.

Q. WHAT ARE THE ANALYSTS' ESTIMATES OF FUTURE EPS GROWTH?

A. As part of their research, financial analysts periodically estimate EPS growth for each firm they follow. The EPS forecasts for each firm are then published. Investors who are contemplating purchasing or selling shares in individual firms review the forecasts and use them in making stock buy and sell decisions.

Q. WHAT IS "I/B/E/S"?

A. I/B/E/S is a division of Thomson Financial that reports analysts' EPS growth forecasts for a broad group of companies. The forecasts are expressed in terms of a mean forecast and a standard deviation of forecast for each firm. Investors use the mean forecast as an estimate of future firm performance.

Q. WHY DID YOU USE THE I/B/E/S GROWTH ESTIMATES?

A. The I/B/E/S growth rates: (1) are widely circulated in the financial community; (2) include the projections of reputable financial analysts who develop estimates of future EPS growth; (3) are reported on a timely basis to investors; and (4) are widely used by institutional and other investors.

Q. WHY DID YOU RELY ON ANALYSTS' PROJECTIONS OF FUTURE EPS GROWTH RATHER THAN LOOKING AT PAST HISTORICAL GROWTH RATES?

A. I relied on analysts' projections of future EPS growth because there is considerable empirical evidence that investors use analysts' forecasts to estimate future earnings growth, which determines the price of stock.

Q. HAVE YOU PERFORMED ANY STUDIES CONCERNING THE USE OF ANALYSTS' FORECASTS AS AN ESTIMATE OF INVESTORS' EXPECTED GROWTH?

A. Yes, I prepared a study in conjunction with Willard T. Carleton, Professor of Finance at the University of Arizona, on why analysts' forecasts are the best estimate of investors' expectation of future long-term growth. This study is described in a paper entitled "Investor Growth Expectations and Stock Prices: the Analysts versus History," published in the Spring 1988 edition of *The Journal of Portfolio Management*.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR STUDY.

A. First, we performed a correlation analysis to identify the historically oriented growth rates which best described a firm's stock price. Then we did a regression study comparing the historical growth rates with the average I/B/E/S analysts' forecasts. In every case, the regression equations containing the average of analysts' forecasts statistically provided a stronger correlation with stock prices than the regression equations containing the historical growth estimates. These results are consistent with those found by Cragg and Malkiel, the early major research in this area (John G. Cragg and Burton G. Malkiel, *Expectations and the Structure of Share Prices*, University of Chicago Press, 1982). These results are also consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy and sell decisions. They provide

overwhelming evidence that the analysts' forecasts of future growth are superior to historically-oriented growth measures in predicting a firm's stock price.

Q. HAS YOUR STUDY BEEN UPDATED TO INCLUDE MORE RECENT DATA?

A. Yes. Researchers at State Street Financial Advisors updated my study using data through year-end 2003. Their results continue to confirm that analysts' growth forecasts are superior to historically-oriented growth measures in predicting a firm's stock price.

Q. WHAT PRICE DID YOU USE IN YOUR DCF MODEL?

A. I used a simple average of the monthly high and low stock prices for each firm for the three-month period ending September 2007. These high and low stock prices were obtained from Thomson Financial.

Q. WHY DID YOU USE THE THREE-MONTH AVERAGE STOCK PRICE IN APPLYING THE DCF METHOD?

A. I used the three-month average stock price in applying the DCF method because stock prices fluctuate daily, while financial analysts' forecasts for a given company are generally changed less frequently, often on a quarterly basis. Thus, the average price over a three-month period matches the period of the analysts' forecasts, and it is appropriate to average stock prices over a three-month period.

Q. DID YOU INCLUDE AN ALLOWANCE FOR FLOTATION COSTS IN YOUR DCF ANALYSIS?

A. Yes. I have included a 5 percent allowance for flotation costs in my DCF calculations. As described below, my 5 percent flotation cost allowance is a

conservative estimate of the flotation costs Xcel Energy has actually incurred in its equity issuances.

Q. WHAT ARE FLOTATION COSTS?

A. Flotation costs are the costs associated with the sale of new issues of common stock. These costs include out-of-pocket expenditures for the preparation, filing, underwriting, and other costs of issuance of common stock.

Q. ARE FLOTATION COSTS PART OF THE UTILITY'S INVESTED COSTS, OR PART OF THE UTILITY'S EXPENSES?

A. Flotation costs are part of the invested costs of the utility and are reflected on the balance sheet of the utility as reduction to "paid in capital" or "paid in surplus" to reflect the reduced proceeds from the equity issuance. Flotation costs are not expenses and are not reflected in the income statement in the year in which common stock is issued. Flotation costs, like investments in rate base or the issuance costs of long-term debt, are incurred over time. As a result, most of a utility's flotation costs are incurred prior to the test year, but remain part of the cost structure that exists during the test year.

Q. IS IT IMPORTANT TO RECOGNIZE FLOTATION COSTS IN THE ALLOWED RETURN ON EQUITY?

A. Yes. In order to attract and retain new investors, a regulated utility must have the opportunity to earn a return that is both compensatory and competitive. To the extent that a company is denied the opportunity to recover prudently incurred flotation costs, actual returns will fall short of expected (or required) returns, thereby diminishing its ability to attract adequate capital on reasonable terms.

Q. ARE FLOTATION COSTS COMPARABLE TO OTHER COSTS THAT A COMPANY INCURS?

A. Yes. Flotation costs are closely analogous to the issuance costs associated with long-term debt. Like the equity flotation costs, the issuance costs associated with long-term debt include out-of-pocket expenditures for the promotion, preparation, filing, and underwriting of the debt issuance.

Q. ARE THESE ISSUANCE COSTS ASSOCIATED WITH LONG TERM DEBT RECOGNIZED FOR RATEMAKING PURPOSES?

A. Yes. These costs are routinely recognized in every jurisdiction with which I am familiar.

Q. OVER WHAT PERIODS OF TIME ARE ISSUANCE AND FLOTATION COSTS RECOGNIZED?

A. The issuance costs associated with long-term debt reflect the incurrence of upfront costs that can be assigned a definite life or period of applicability. These costs are taken to expense over the life of the debt issuance, either to maturity or upon retirement of the debt. Equity issuance or flotation costs, however, do not have a definite period of applicability, but rather have the same indefinite life as the underlying equity with which they are associated.

Q. IS THE NEED FOR A FLOTATION COST ADJUSTMENT RECOGNIZED BY THE ACADEMIC AND FINANCIAL COMMUNITIES?

A. Yes. The academic and financial communities recognize that flotation costs are a legitimate expense of obtaining capital that must be recovered through the regulatory process. If a company is unable to recover its flotation costs through a flotation cost adjustment, it will be not be able to offer investors a

return commensurate with returns they could earn on other investments of comparable risk.

Q. IS THE NEED FOR A FLOTATION COST ADJUSTMENT AFFECTED BY THE FACT THAT THE COMPANY IS A WHOLLY-OWNED SUBSIDIARY OF ITS PARENT, XCEL ENERGY INC.?

A. No. Wholly-owned subsidiaries receive equity capital from their parents and provide returns on the capital that roll up to the parent, which is designated to attract and raise capital based upon the returns of those subsidiaries. To deny the subsidiary a rate of return sufficient to recover the issuance costs associated with the capital that is invested in the subsidiaries ultimately will penalize the investors that fund the utility operations and will inhibit the ability of the utility to obtain new equity capital. Further, the Company's paid-in equity is primarily the result of prior public issuances of common stock made by the former Northern States Power Co. before the merger that formed Xcel Energy Inc., when Northern States Power Co. was itself a publicly-traded entity. As a result, the most of the Company's paid-in equity was, in effect, the result of public issuances of equity by the Company itself.

Q. DO THE DCF, RISK PREMIUM AND CAPM MODELS INCORPORATE INVESTOR EXPECTATIONS OF A RETURN THAT COMPENSATES FOR FLOTATION COSTS?

A. No. All the models used to estimate the appropriate return on equity assume no "friction" or transaction costs, as these costs are not reflected in the market price (in the case of the DCF model) or risk premium (in the case of the Risk Premium model and CAPM). Thus, it is necessary to add a component to the models to compensate investors for these costs.

Q. HOW DID YOU CALCULATE THE FLOTATION COST ADJUSTMENT?

A. I calculated the flotation cost adjustment by adjusting the dividend yield component of the DCF calculation to reimburse investors for issuance costs. (See Exhibit___(JVW-1), Schedule 1.) My dividend yield adjustment is the standard approach in the finance literature for calculating the cost of equity in the presence of flotation costs. As noted above, my flotation cost adjustment is based upon a 5 percent flotation cost, which is slightly less than the Company's actual 5.11 percent flotation costs for its common stock issuances. (See Exhibit ___(JVW-1), Schedule 2.)

Q. HOW DID YOU APPLY THE DCF APPROACH TO OBTAIN THE COST OF EQUITY CAPITAL FOR XCEL ENERGY?

A. I applied the DCF approach to the Value Line electric companies shown in Exhibit___(JVW-1) Schedule 1.

Q. HOW DID YOU SELECT YOUR PROXY GROUP OF ELECTRIC COMPANIES?

A. I selected all the companies in Value Line's groups of electric companies that: (1) paid dividends during every quarter of the last two years; (2) did not decrease dividends during any quarter of the past two years; (3) had at least three analysts included in the I/B/E/S mean growth forecast; (4) have an investment grade bond rating and a Value Line Safety Rank of 1, 2, or 3; and (5) are not the subject of a merger offer that has not been completed.

Q. WHY DID YOU ELIMINATE COMPANIES THAT HAVE EITHER DECREASED OR ELIMINATED THEIR DIVIDEND IN THE PAST TWO YEARS?

A. The DCF model requires the assumption that dividends will grow at a constant rate into the indefinite future. If a company has either decreased or eliminated its dividend in recent years, an assumption that the company's dividend will grow at the same rate into the indefinite future is questionable.

Q. WHY DID YOU ELIMINATE COMPANIES THAT HAVE FEWER THAN THREE ANALYSTS INCLUDED IN THE I/B/E/S MEAN FORECASTS?

A. The DCF model also requires a reliable estimate of a company's expected future growth. For most companies, the I/B/E/S mean growth forecast is the best available estimate of the growth term in the DCF model. However, the I/B/E/S estimate may be less reliable if the mean estimate is based on the inputs of very few analysts. On the basis of my professional judgment, I believe that at least three analysts' estimates are a reasonable minimum number.

Q. WHY DID YOU ELIMINATE COMPANIES THAT ARE THE SUBJECT OF A MERGER OFFER THAT HAS NOT BEEN COMPLETED?

A. A merger announcement can sometimes have a significant impact on a company's stock price because of anticipated merger-related cost savings and new market opportunities. Analysts' growth forecasts, on the other hand, are necessarily related to companies as they currently exist, and do not reflect investors' views of the potential cost savings and new market opportunities associated with mergers. The use of a stock price that includes the value of potential mergers in conjunction with growth forecasts that do not include the growth enhancing prospects of potential mergers produces DCF results that tend to distort a company's cost of equity.

Q. IS THE RISK OF AN EQUITY INVESTMENT IN YOUR PROXY GROUP GENERALLY SIMILAR TO THE RISK OF AN EQUITY INVESTMENT IN XCEL ENERGY?

A. Yes. Many investors use the Value Line Safety Rank as a measure of equity risk. As shown on Exhibit___(JVW-1) Schedule 1, the average Value Line Safety Rank for my proxy group of electric companies is 2, on a scale where 1 is the most safe and 5 is the least safe, and the Value Line Safety Rank for Xcel Energy is 2. The average Standard & Poor's ("S&P") corporate bond

rating of the electric companies in my proxy group is approximately BBB+, and the S&P corporate bond rating for Xcel Energy is BBB+.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR APPLICATION OF THE DCF MODEL TO YOUR PROXY COMPANY GROUP.

A. As shown on Exhibit___(JVW-1) Schedule 1, I obtain a DCF result of 11.6 percent for my proxy company group.

B. Risk Premium Method

Q. PLEASE DESCRIBE THE RISK PREMIUM METHOD OF ESTIMATING XCEL ENERGY'S COST OF EQUITY.

A. The risk premium method is based on the principle that investors expect to earn a return on an equity investment in a company that reflects a "premium" over and above the return they expect to earn on an investment in a portfolio of bonds. This equity risk premium compensates equity investors for the additional risk they bear in making equity investments versus bond investments.

Q. WHY IS IT APPROPRIATE TO EXAMINE THE YIELD FROM DEBT INVESTMENTS IN ORDER TO DETERMINE THE INVESTORS' REQUIRED RATE OF RETURN ON EQUITY CAPITAL?

A. As previously explained, investors expect to earn a return on their equity investment that exceeds currently available bond yields. This is because the return on equity, being a residual return, is less certain than the yield on bonds; and investors must be compensated for this uncertainty. Second, the investors' current expectations concerning the amount by which the return on equity will exceed the bond yield will be influenced by historical

differences in returns to bond and stock investors. For these reasons, we can estimate investors' current expected returns from an equity investment from knowledge of current bond yields and past differences between returns on stocks and bonds.

Q. DOES THE RISK PREMIUM APPROACH SPECIFY WHAT DEBT INSTRUMENT SHOULD BE USED TO ESTIMATE THE INTEREST RATE COMPONENT IN THE METHODOLOGY?

A. No. The risk premium approach can be implemented using virtually any debt instrument. However, the risk premium approach does require that the debt instrument used to estimate the risk premium be the same as the debt instrument used to calculate the interest rate component of the risk premium approach. For example, if the risk premium on equity is calculated by comparing the returns on stocks and the returns on A-rated utility bonds, then the interest rate on A-rated utility bonds must be used to estimate the interest rate component of the risk premium approach.

Q. DOES THE RISK PREMIUM APPROACH REQUIRE THAT THE SAME COMPANIES BE USED TO ESTIMATE THE STOCK RETURN AND THE BOND RETURN?

A. No. For example, many analysts apply the risk premium approach by comparing the return on a portfolio of stocks to the return on Treasury securities, such as long-term Treasury bonds. Clearly, in this widely-accepted application of the risk premium approach, the same companies are not used to estimate the stock return as are used to estimate the bond return, since the U.S. government is not a company.

Q. HOW DID YOU MEASURE THE REQUIRED RISK PREMIUM ON AN EQUITY INVESTMENT IN XCEL ENERGY?

A. I used two methods to estimate the required risk premium on an equity investment in Xcel Energy. The first is called the "ex ante" risk premium method and the second is called the "ex post" risk premium method.

1. Ex Ante Risk Premium Method

Q. PLEASE DESCRIBE YOUR EX ANTE RISK PREMIUM APPROACH.

A. My ex ante risk premium method is based on studies of the DCF expected return on a proxy group of electric companies compared to the interest rate on Moody's Investors Service ("Moody's") A-rated utility bonds. Specifically, for each month in my study period, I calculated the risk premium using the equation,

$$RP_{PROXY} = DCF_{PROXY} - I_A$$

where:

RP_{PROXY}	=	the required risk premium on an equity investment in the proxy group of companies;
DCF_{PROXY}	=	average DCF estimated cost of equity on a portfolio of proxy companies; and
I_A	=	the yield to maturity on an investment in A-rated utility bonds.

I then performed a regression analysis to determine if there was a relationship between the calculated risk premium and interest rates. Finally, I used the results of the regression analysis to estimate the investors' required risk premium. To estimate the cost of equity, I then added the required risk premium to the yield to maturity on A-rated utility bonds. A detailed description of my ex ante risk premium studies is contained in Exhibit___(JVW-1) Appendix 3, and the underlying DCF results and

interest rates are displayed in Exhibit___(JVW-1) Schedule 3. As shown on Exhibit___(JVW-1) Schedule 3, the effects of flotation costs are reflected in the underlying DCF results.

Q. WHY DID YOU ADD THE REQUIRED RISK PREMIUM TO THE CURRENT YIELD TO MATURITY ON A-RATED UTILITY BONDS RATHER THAN THE FORECASTED YIELD TO MATURITY?

A. Although it is appropriate in theory to add the required risk premium to the forecasted yield to maturity on A-rated utility bonds, I added the required risk premium to the current yield to maturity on A-rated utility bonds because the current and forecasted yields are approximately equal at the time of my studies, and the current yield is readily observable.[4]

Q. WHAT COST OF EQUITY DO YOU OBTAIN FROM YOUR EX ANTE RISK PREMIUM METHOD?

A. The average yield to maturity on A-rated utility bonds in September 2007 is 6.18 percent. My analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to 5.02 percent. Adding an estimated risk premium of 5.02 percent to the 6.18 percent average yield to maturity on A-rated utility bonds produces a cost of equity estimate of 11.2 percent using the ex ante risk premium method.

[4] As noted above, one could use the yield to maturity on other debt investments to measure the interest rate component of the risk premium approach as long as one uses the yield on the same debt investment to measure the expected risk premium component of the risk premium approach. I chose to use the yield on A-rated utility bonds because it is a frequently used benchmark for utility bond yields.

2. Ex Post Risk Premium Method

Q. PLEASE DESCRIBE YOUR EX POST RISK PREMIUM METHOD.

A. I first performed a study of the comparable returns received by bond and stock investors over the last 70 years. I estimated the returns on stock and bond portfolios, using stock price and dividend yield data on the S&P 500 and bond yield data on Moody's A-rated Utility Bonds. My study consisted of making an investment of one dollar in the S&P 500 and Moody's A-rated Utility Bonds at the beginning of 1937 and reinvesting the principal plus returns each year to 2007. The return associated with each stock portfolio is the sum of the annual dividend yield and capital gain (or loss) that accrued to this portfolio during the year(s) in which it was held. The return associated with the bond portfolio, on the other hand, is the sum of the annual coupon yield and capital gain (or loss) that accrued to the bond portfolio during the year(s) in which it was held. The resulting annual returns on the stock and bond portfolios purchased in each year from 1937 through 2006 are shown on Exhibit___(JVW-1) Schedule 4. The average annual return on an investment in the S&P 500 stock portfolio was 11.6 percent, while the average annual return on an investment in the Moody's A-rated utility bond portfolio was 6.4 percent. The risk premium on the S&P 500 stock portfolio, therefore, is 5.2 percent.

I also conducted a second study using stock data on the S&P Utilities rather than the S&P 500. As shown on Exhibit___(JVW-1) Schedule 5, the S&P Utility stock portfolio showed an average annual return of 10.9 percent per year. Thus, the return on the S&P Utility stock portfolio exceeded the return on the Moody's A-rated utility bond portfolio by 4.5 percent.

Q. WHY IS IT APPROPRIATE TO PERFORM YOUR EX POST RISK PREMIUM ANALYSIS USING BOTH THE S&P 500 AND THE S&P UTILITIES STOCK INDICES?

A. I have performed my ex post risk premium analysis on both the S&P 500 and the S&P Utilities as upper and lower bounds for the required risk premium on an equity investment in an electric utility such as Xcel Energy because I believe electric energy companies today face risks that are somewhere in between the average risk of the S&P Utilities and the S&P 500 over the years 1937 through 2006. Specifically, the risk premium on the S&P Utilities, 4.5 percent, represents a lower bound for the required risk premium on an equity investment in an electric utility such as Xcel Energy because an investment in the typical electric utility is currently more risky than an investment in the average utility in the S&P Utilities index over the entire period 1937 to the present. The added risk arises from the changes in risk factors described above in my testimony. On the other hand, the risk premium on the S&P 500, 5.2 percent, represents an upper bound because an investment in an electric utility such as Xcel Energy is less risky than an investment in the S&P 500 over the period 1937 to the present. Therefore, I use the average of the two risk premiums as my estimate of the required risk premium for Xcel Energy in my ex post risk premium method.

Q. WHY DID YOU ANALYZE INVESTORS' EXPERIENCES OVER SUCH A LONG TIME FRAME?

A. My policy was to go back as far in history as I could get reliable data. I thought it would be most meaningful to begin after the passage and implementation of the Public Utility Holding Company Act of 1935. This Act significantly changed the structure of the public utility industry. Since the Public Utility Holding Company Act of 1935 was not implemented until the beginning of 1937, I felt that numbers taken from before this date would

not be comparable to those taken after. (The repeal of the 1935 Act does not have a material impact on the structure of the public utility industry; thus, the Act's repeal does not have any impact on my choice of time period.)

Q. HAS THERE BEEN ANY SIGNIFICANT TREND IN THE EQUITY RISK PREMIUM OVER THE 1937 TO 2007 TIME PERIOD OF YOUR RISK PREMIUM STUDY?

A. No. Statisticians test for trends in data series by regressing the data observations against time. My analysis shows that there is no statistically significant trend in my risk premium data. Indeed, the coefficient on the time variable is insignificantly different from zero (if there were a trend, the coefficient on the time variable should be significantly different from zero). My analysis and results are further set forth on Exhibit___(JVW-1) Schedule 6.

Q. DO YOU HAVE ANY OTHER EVIDENCE THAT THERE HAS BEEN NO SIGNIFICANT TREND IN RISK PREMIUM RESULTS OVER TIME?

A. Yes. Morningstar's *Stocks, Bonds, Bills, and Inflation® 2007 Valuation Edition Yearbook* ("SBBI") (Morningstar has purchased the publication formerly published by Ibbotson Associates) contains an analysis of "trends" in historical risk premium data. Morningstar uses correlation analysis to determine if there is any pattern or "trend" in risk premiums over time. The analysis by Morningstar also demonstrates that there are no trends in risk premiums over time.

Q. WHAT IS THE SIGNIFICANCE OF THE EVIDENCE THAT HISTORICAL RISK PREMIUMS HAVE NO TREND OR OTHER STATISTICAL PATTERN OVER TIME?

A. The significance of this evidence is that the average historical risk premium is a reasonable estimate of the future expected risk premium. As noted in SBBI:

> The significance of this evidence is that the realized equity risk premium next year will not be dependent on the realized equity risk premium from this year. That is, there is no discernable pattern in the realized equity risk premium—it is virtually impossible to forecast next year's realized risk premium based on the premium of the previous year. For example, if this year's difference between the riskless rate and the return on the stock market is higher than last year's, that does not imply that next year's will be higher than this year's. It is as likely to be higher as it is lower. The best estimate of the expected value of a variable that has behaved randomly in the past is the average (or arithmetic mean) of its past values.[5]

Q. YOU NOTED THAT MORNINGSTAR ALSO PROVIDES RISK PREMIUM DATA. HOW DO THE MORNINGSTAR RISK PREMIUMS COMPARE TO YOUR RISK PREMIUMS?

A. Morningstar obtains a 7.1 percent risk premium on the S&P 500 versus 20-year Treasury bonds. Since the yield on 20-year Treasury bonds is currently approximately 130 basis points less than the yield on A - rated utility bonds, the Morningstar data indicate an approximate 5.8 percent risk premium on the S&P 500 over A - rated utility bonds. As shown on Exhibit___(JVW-1) Schedule 5 and Exhibit___(JVW-1) Schedule 6, my studies produce a risk premium over A - rated utility bonds in the range of 4.5 percent to 5.2 percent. The comparison of my risk premium results (4.5 percent to 5.2

[5] SBBI at 81.

percent over A-rated utility bonds) to the Morningstar data (which implies a risk premium of 5.8 percent over A-rated utility bonds) indicates that my risk premium analysis is conservative.

Q. WHAT CONCLUSIONS DO YOU DRAW FROM YOUR EX POST RISK PREMIUM ANALYSES ABOUT THE REQUIRED RETURN ON AN EQUITY INVESTMENT IN XCEL ENERGY?

A. My studies provide strong evidence that investors today require an equity return of at least 4.5 to 5.2 percentage points above the expected yield on A-rated utility bonds. The September 2008 average interest rate on Moody's A - rated utility bonds is 6.18 percent. Adding a 4.5 to 5.2 percentage point risk premium to a yield of 6.2 percent on A-rated utility bonds, I obtain an expected return on equity in the range 10.7 percent to 11.4 percent, with a midpoint of 11.0 percent. Because the ex post methodology does not reflect flotation costs, I have added a 20 basis-point allowance for flotation costs, which I determined by calculating the difference in my DCF results with and without a flotation cost allowance. Adding the 20 basis-point flotation cost allowance to my 11.0 percent midpoint result, I obtain a cost of equity estimate of 11.2 percent using the ex post risk premium method. My ex post risk premium cost of equity estimate is conservative because my risk premium estimate is lower than the Morningstar implied risk premium.

C. Capital Asset Pricing Model

Q. WHAT IS THE CAPM?

A The CAPM is an equilibrium model of the security markets in which the expected or required return on a given security is equal to the risk-free rate of interest, plus the company equity "beta," times the market risk premium:

Cost of equity = Risk-free rate + Equity beta x Market risk premium

The risk-free rate in this equation is the expected rate of return on a risk-free government security, the equity beta is a measure of the company's risk relative to the market as a whole, and the market risk premium is the premium investors require to invest in the market basket of all securities compared to the risk-free security.

Q. HOW DID YOU USE THE CAPM TO ESTIMATE THE COST OF EQUITY FOR YOUR PROXY COMPANIES?

A. The CAPM requires an estimate of the risk-free rate, the company-specific risk factor or beta, and the expected return on the market portfolio. For my estimate of the risk-free rate, I used the September 2007 average yield to maturity on 20-year Treasury bonds, 4.84 percent. For my estimate of the company-specific risk, or beta, I used the average 0.91 Value Line beta for my proxy electric companies. For my estimate of the expected risk premium on the market portfolio, I used two approaches. First, I used Morningstar's 7.1 percent risk premium on the market portfolio, which is measured from the difference between the arithmetic mean return on the S&P 500 (12.34 percent) and the income return on 20-year Treasury bonds (5.21 percent), as reported by Morningstar (12.34 – 5.21 = 7.1). Second, I estimated the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500, 13.7 percent, and the yield to maturity on 20-year Treasury bonds, 4.84 percent. My second approach produces a risk premium equal to 8.86 percent (13.7 - 4.84 = 8.86).

1. Historical CAPM

Q. WHY DO YOU RECOMMEND THAT THE RISK PREMIUM ON THE MARKET PORTFOLIO BE ESTIMATED USING THE ARITHMETIC MEAN RETURN ON THE S&P 500?

A. As explained in SBBI, the arithmetic mean return is the best approach for calculating the return investors expect to receive in the future:

> The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return.[6]

A discussion of the importance of using arithmetic mean returns in the context of CAPM or risk premium studies is contained in Exhibit___(JVW-1) Schedule 7.

Q. WHY DO YOU RECOMMEND THAT THE RISK PREMIUM ON THE MARKET PORTFOLIO BE MEASURED USING THE INCOME RETURN ON 20-YEAR TREASURY BONDS RATHER THAN THE TOTAL RETURN ON THESE BONDS?

A. As discussed above, the CAPM requires an estimate of the risk-free rate of interest. When Treasury bonds are issued, the income return on the bond is

[6] SBBI at 77.

risk free, but the total return, which includes both an income and capital gains or losses, is not. Thus, the income return should be used in the CAPM because it is only the income return that is risk free.

Q. WHAT CAPM RESULT DID YOU OBTAIN USING THE HISTORICAL MARKET RETURN?

A. I obtain a CAPM cost of equity estimate of 11.5 percent, including an allowance for flotation costs (see Exhibit___(JVW-1) Schedule 8).

2. DCF-Based CAPM

Q. HOW DOES YOUR DCF-BASED CAPM APPROACH DIFFER FROM YOUR HISTORICAL CAPM APPROACH?

A. Like my historical CAPM approach, my DCF-based CAPM approach estimates the risk-free rate and beta using the yield-to-maturity on 20-year Treasury bonds and the average Value Line beta for my proxy companies, respectively. However, my DCF-based CAPM approach estimates the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500 and the yield to maturity on 20-year Treasury bonds.

Q. WHAT CAPM RESULT DID YOU OBTAIN USING THE DCF-BASED MARKET RETURN?

A. I obtain a CAPM result of 13.1 percent, including an allowance for flotation costs (see Exhibit___(JVW-1) Schedule 9).

Q. WHAT IS YOUR ESTIMATE OF THE COST OF EQUITY BASED ON YOUR TWO CAPM STUDIES?

A. My historical CAPM study produced a cost of equity estimate of 11.5 percent, and my DCF-based CAPM study produced a cost of equity estimate of 13.1 percent. I have used the average of these two results, 12.3 percent, as my CAPM estimate of the cost of equity.

Q. IS THERE EVIDENCE THAT THE COST OF EQUITY MAY BE HIGHER THAN THE RESULTS OF YOUR CAPM STUDIES?

A. Yes. There is substantial evidence that the CAPM tends to underestimate the cost of equity for companies whose equity beta is less than 1.0 and to overestimate the cost of equity for companies whose equity beta is greater than 1.0. Since the average beta for my proxy group of electric utilities is 0.91, the CAPM will tend to understate the cost of equity for proxy group of electric utilities.

Q. WHAT IS THE EVIDENCE THAT THE CAPM TENDS TO UNDERESTIMATE THE COST OF EQUITY FOR COMPANIES WITH BETAS LESS THAN 1.0?

A. The original evidence that the unadjusted CAPM tends to underestimate the cost of equity for companies whose equity beta is less than 1.0 and to overestimate the cost of equity for companies whose equity beta is greater than 1.0 was presented in a paper by Black, Jensen, and Scholes, "The Capital Asset Pricing Model: Some Empirical Tests." Numerous subsequent papers have validated the Black, Jensen, and Scholes findings, including

those by Litzenberger and Ramaswamy, Banz, Fama and French, and Fama and MacBeth.[7]

VI. FAIR RATE OF RETURN ON EQUITY

Q. BASED ON YOUR ANALYSES, WHAT IS YOUR CONCLUSION REGARDING YOUR PROXY COMPANIES' COST OF EQUITY?

A. Based on my analyses, which included the application of several cost of equity methods to my proxy companies, I conclude that my proxy companies' cost of equity is 11.7 percent. As discussed above, 11.7 percent is the simple average of the cost of equity results I obtain from my cost of equity models.

Q. DOES THE COST OF EQUITY FOR XCEL ENERGY DEPEND ON ITS RATEMAKING CAPITAL STRUCTURE?

A. Yes. My analyses are based on the average market value capital structure of my proxy companies, which has approximately 65 percent equity. If Xcel Energy's ratemaking, or book value capital structure, is used to set rates, the cost of equity for Xcel Energy will necessarily be higher than the 11.7 percent cost of equity for proxy group because the financial risk associated with Xcel Energy's book value capital structure is higher than the financial risk reflected in the cost of equity estimate for my proxy companies.

[7] Fischer Black, Michael C. Jensen, and Myron Scholes, "The Capital Asset Pricing Model: Some Empirical Tests," in *Studies in the Theory of Capital Markets*, M. Jensen, ed. New York: Praeger, 1972; Eugene Fama and James MacBeth, "Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political Economy* 81 (1973), pp. 607-36; Robert Litzenberger and Krishna Ramaswamy, "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence," *Journal of Financial Economics* 7 (1979), pp. 163-95.; Rolf Banz, "The Relationship between Return and Market Value of Common Stocks," *Journal of Financial Economics* (March 1981), pp. 3-18; and Eugene Fama and Kenneth French, "The Cross-Section of Expected Returns," *Journal of Finance* (June 1992), pp. 427-465.

Q. WHAT ROE DO YOU RECOMMEND FOR XCEL ENERGY?

A. I recommend an ROE of 11.5 percent for Xcel Energy. My recommendation takes into consideration Xcel Energy's policy decision to moderate the impact of its rate request on ratepayers. My recommendation is conservative in that: (1) it is 20 basis points lower than the 11.7 percent average cost of equity result from my DCF, Risk Premium, and CAPM analyses; (2) it is 10 basis points lower than the 11.6 percent result of my DCF analysis of the proxy group; and (3) it does not reflect the higher financial risk implicit in the book value capital structure of Xcel Energy, which will be used to set rates in this proceeding. Each of these factors would justify a ROE that is higher than the 11.5 percent that I have recommended.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

LIST OF ATTACHMENTS

SCHEDULE 1
SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS
FOR ELECTRIC ENERGY COMPANIES

Line No.	Company	d_0	P_0	Growth	Cost of Equity
1	Alliant Energy	0.318	37.975	5.67%	9.4%
2	Amer. Elec. Power	0.390	45.438	5.91%	9.9%
3	Ameren Corp.	0.635	50.742	7.30%	13.2%
4	Black Hills	0.340	40.672	6.67%	10.5%
5	CenterPoint Energy	0.170	16.535	11.00%	15.9%
6	Consol. Edison	0.580	45.648	3.23%	8.9%
7	Constellation Energy	0.435	86.562	16.00%	18.5%
8	Dominion Resources	0.710	86.177	7.83%	11.7%
9	DPL Inc.	0.260	27.305	6.33%	10.7%
10	DTE Energy	0.530	48.437	5.75%	10.8%
11	Edison Int'l	0.290	54.925	6.85%	9.3%
12	Entergy Corp.	0.750	103.193	9.80%	12.6%
13	Exelon Corp.	0.440	73.930	9.64%	12.4%
14	FirstEnergy Corp.	0.500	63.102	8.33%	12.0%
15	FPL Group	0.410	59.632	9.29%	12.5%
16	G't Plains Energy	0.415	28.643	3.67%	10.2%
17	Hawaiian Elec.	0.310	22.192	2.27%	8.5%
18	Integrys Energy	0.660	51.330	6.33%	12.0%
19	MDU Resources	0.145	27.402	7.35%	9.7%
20	NiSource Inc.	0.230	19.639	3.54%	8.8%
21	Northeast Utilities	0.200	28.027	10.25%	13.6%
22	NSTAR	0.325	32.762	6.67%	11.2%
23	Otter Tail Corp.	0.293	33.570	5.00%	9.0%
24	Pepco Holdings	0.260	27.122	8.60%	13.2%
25	PG&E Corp.	0.360	45.228	8.88%	12.6%
26	Pinnacle West Capital	0.525	39.543	5.73%	11.9%
27	PNM Resources	0.230	24.527	10.47%	15.0%
28	PPL Corp.	0.305	48.373	12.00%	15.1%
29	Progress Energy	0.610	46.057	5.07%	11.2%

24	Public Serv. Enterprise	0.585	85.922	18.00%	21.6%
30	Puget Energy Inc.	0.250	23.963	5.25%	10.0%
31	SCANA Corp.	0.440	37.728	4.25%	9.5%
32	Sempra Energy	0.310	56.177	7.27%	9.8%
33	Southern Co.	0.403	35.365	5.03%	10.2%
34	Westar Energy	0.270	24.465	5.33%	10.3%
35	Wisconsin Energy	0.250	43.998	9.04%	11.7%
36	Xcel Energy Inc.	0.230	20.835	5.60%	10.6%
37	Market-weighted average				12.3%
36	Market-weighted average w/o 2 highest and 2 lowest DCF results				11.6%

Notes:

d_0	=	Most recent quarterly dividend.
d_1,d_2,d_3,d_4	=	Next four quarterly dividends, calculated by multiplying the last four quarterly dividends per Value Line, by the factor (1 + g).
P_0	=	Average of the monthly high and low stock prices during the three months ending September 2007 per Thomson Financial.
FC	=	Flotation costs expressed as a percent of gross proceeds (5%).
g	=	I/B/E/S forecast of future earnings growth September 2007.
k	=	Cost of equity using the quarterly version of the DCF model.

$$k = \frac{d_1(1+k)^{.75} + d_2(1+k)^{.50} + d_3(1+k)^{.25} + d_4}{P_0(1-FC)} + g$$

RISK RATINGS
OF PROXY ELECTRIC ENERGY COMPANIES

Line No.	Company	Safety Rank	S&P BOND RATING	S&P BOND RATING (Numerical)	Beta
1	Alliant Energy	3	BBB+	6	0.90
2	Amer. Elec. Power	3	BBB	7	1.15
3	Ameren Corp.	2	BBB-	8	0.80
4	Black Hills	3	BBB-	8	1.10
5	CenterPoint Energy	3	BBB	7	0.70
6	Consol. Edison	1	A	4	0.70
7	Dominion Resources	2	BBB	7	1.05
8	DPL Inc.	3	BBB	7	0.90
9	DTE Energy	3	BBB	7	0.80
10	Edison Int'l	3	BBB-	8	1.05
11	Entergy Corp.	2	BBB	7	0.85
12	Exelon Corp.	1	BBB+	6	0.90
13	FirstEnergy Corp.	2	BBB	7	0.90
14	FPL Group	1	A	4	0.80
15	G't Plains Energy	2	BBB	7	0.85
16	Integrys Energy	2	A-	5	0.85
17	MDU Resources	1	BBB+	6	0.85
18	Northeast Utilities	3	BBB	7	0.85
19	NSTAR	1	A+	3	0.75
20	Otter Tail Corp.	2	BBB+	6	0.75
21	Pepco Holdings	3	BBB	7	0.90
22	PG&E Corp.	2	BBB+	6	0.95
23	Pinnacle West Capital	1	BBB-	8	1.00
24	PNM Resources	2	BBB	7	0.95
25	PPL Corp.	2	BBB	7	0.95

26	Progress Energy	2	BBB+	6	0.95
27	Puget Energy Inc.	3	BBB-	8	0.80
28	SCANA Corp.	2	A-	5	0.80
29	Sempra Energy	2	BBB+	6	1.00
30	Southern Co.	1	A	4	0.75
31	Westar Energy	2	BBB-	8	0.90
32	Wisconsin Energy	2	BBB+	6	0.80
33	Xcel Energy Inc.	2	BBB+	7	1.05
34	Market-Wtd. Ave.	2	BBB+	6	0.91

Source of data: Standard & Poor's October 2007; The Value Line Investment Analyzer October 2007.

SCHEDULE 2
FLOTATION COST EXPENSES
NORTHERN STATES POWER
1949 - 2007

Date	Issuing Company	No. of Shares	Market Price	Offering Price	Underwriting Discount	Offering Expense	Net Proceeds	Total Flotation Costs	Gross Equity Issue Before Costs	Net Proceeds	Flotation Costs as % of Gross
16-Nov-49	Northern States Power	1,584,238	$10.75	$10.25	$0.124	$0.137	$9.989	1,205,605	17,030,559	15,824,953	7.08%
4-Jun-52	Northern States Power	1,108,966	$10.50	$10.50	$0.098	$0.162	$10.240	288,331	11,644,143	11,355,812	2.48%
14-Apr-54	Northern States Power	1,219,856	$15.25	$14.00	$0.060	$0.124	$13.816	1,749,274	18,602,804	16,853,530	9.40%
29-Feb-56	Northern States Power	670,920	$17.83	$16.75	$0.050	$0.221	$16.479	903,058	11,959,149	11,056,091	7.55%
11-Jul-59	Northern States Power	952,033	$23.38	$22.00	$0.069	$0.191	$21.740	1,556,574	22,253,771	20,697,197	6.99%
28-Jul-65	Northern States Power	772,008	$35.25	$33.00	$0.092	$0.225	$32.683	1,981,745	27,213,282	25,231,537	7.28%
22-Jan-69	Northern States Power	1,080,811	$29.00	$27.00	$0.119	$0.187	$26.694	2,492,350	31,343,519	28,851,169	7.95%
21-Oct-70	Northern States Power	1,729,298	$23.13	$21.50	$0.175	$0.149	$21.176	3,370,402	39,990,016	36,619,614	8.43%
26-Jul-72	Northern States Power	1,902,228	$25.00	$23.50	$0.129	$0.166	$23.205	3,414,499	47,555,700	44,141,201	7.18%
20-Nov-74	Northern States Power	2,092,451	$25.83	$24.50	$0.128	$0.153	$24.219	3,360,476	54,037,547	50,677,071	6.22%
14-Aug-75	Northern States Power	2,300,000	$17.63	$17.50	$0.910	$0.069	$16.521	2,539,200	40,537,500	37,998,300	6.26%
3-Jun-76	Northern States Power	1,750,000	$23.00	$23.00	$0.740	$0.077	$22.183	1,429,750	40,250,000	38,820,250	3.55%
31-May-93	Northern States Power	2,000,000	$24.00	$24.00	$0.720	$0.064	$23.216	1,568,000	48,000,000	46,432,000	3.27%
23-Sep-97	Northern States Power	3,041,955	$44.13	$43.63	$1.200	$0.048	$42.377	5,317,337	134,226,264	128,908,927	3.96%
29-Sep-97	Northern States Power	4,500,000	$49.94	$49.56	$1.230	$0.133	$48.200	7,821,000	224,721,000	216,900,000	3.48%
25-Feb-02	Northern States Power	400,000	$50.50	$49.56	$1.230	$0.133	$48.200	920,000	20,200,000	19,280,000	4.55%
25-Feb-02	Xcel Energy Inc.	20,000,000	$22.95	$22.50	$0.730	$0.015	$21.755	23,900,000	459,000,000	435,100,000	5.21%
	Weighted-Average Cost							63,817,601	1,248,565,255	1,184,747,653	5.11%

Data from Company.

SCHEDULE 3
COMPARISON OF DCF EXPECTED RETURN ON AN INVESTMENT IN ELECTRIC ENERGY COMPANIES TO THE INTEREST RATE ON MOODY'S A-RATED UTILITY BONDS

Line No.	Date	DCF	Bond Yield	Risk Premium
1	Sep-99	0.1169	0.0793	0.0376
2	Oct-99	0.1177	0.0806	0.0371
3	Nov-99	0.1208	0.0794	0.0414
4	Dec-99	0.1258	0.0814	0.0444
5	Jan-00	0.1250	0.0835	0.0415
6	Feb-00	0.1295	0.0825	0.0470
7	Mar-00	0.1336	0.0828	0.0508
8	Apr-00	0.1257	0.0829	0.0428
9	May-00	0.1242	0.0870	0.0372
10	Jun-00	0.1266	0.0836	0.0430
11	Jul-00	0.1276	0.0825	0.0451
12	Aug-00	0.1247	0.0813	0.0434
13	Sep-00	0.1180	0.0823	0.0357
14	Oct-00	0.1182	0.0814	0.0368
15	Nov-00	0.1187	0.0811	0.0376
16	Dec-00	0.1169	0.0784	0.0385
17	Jan-01	0.1205	0.0780	0.0425
18	Feb-01	0.1210	0.0774	0.0436
19	Mar-01	0.1215	0.0768	0.0447
20	Apr-01	0.1277	0.0794	0.0483
21	May-01	0.1304	0.0799	0.0505
22	Jun-01	0.1309	0.0785	0.0524
23	Jul-01	0.1324	0.0778	0.0546
24	Aug-01	0.1330	0.0759	0.0571
25	Sep-01	0.1356	0.0775	0.0581
26	Oct-01	0.1334	0.0763	0.0571
27	Nov-01	0.1338	0.0757	0.0581
28	Dec-01	0.1335	0.0783	0.0552

Line No.	Date	DCF	Bond Yield	Risk Premium
29	Jan-02	0.1314	0.0766	0.0548
30	Feb-02	0.1327	0.0754	0.0573
31	Mar-02	0.1286	0.0776	0.0510
32	Apr-02	0.1250	0.0757	0.0493
33	May-02	0.1258	0.0752	0.0506
34	Jun-02	0.1257	0.0741	0.0516
35	Jul-02	0.1322	0.0731	0.0591
36	Aug-02	0.1269	0.0717	0.0552
37	Sep-02	0.1288	0.0708	0.0580
38	Oct-02	0.1292	0.0723	0.0569
39	Nov-02	0.1238	0.0714	0.0524
40	Dec-02	0.1208	0.0707	0.0501
41	Jan-03	0.1172	0.0706	0.0466
42	Feb-03	0.1210	0.0693	0.0517
43	Mar-03	0.1171	0.0679	0.0492
44	Apr-03	0.1131	0.0664	0.0467
45	May-03	0.1072	0.0636	0.0436
46	Jun-03	0.1027	0.0621	0.0406
47	Jul-03	0.1034	0.0657	0.0377
48	Aug-03	0.1035	0.0678	0.0357
49	Sep-03	0.1006	0.0656	0.0350
50	Oct-03	0.0989	0.0643	0.0346
51	Nov-03	0.0978	0.0637	0.0341
52	Dec-03	0.0949	0.0627	0.0322
53	Jan-04	0.0923	0.0615	0.0308
54	Feb-04	0.0919	0.0615	0.0304
55	Mar-04	0.0916	0.0597	0.0319
56	Apr-04	0.0927	0.0635	0.0292
57	May-04	0.0966	0.0662	0.0304
58	Jun-04	0.0967	0.0646	0.0321
59	Jul-04	0.0959	0.0627	0.0332
60	Aug-04	0.0964	0.0614	0.0350
61	Sep-04	0.0956	0.0598	0.0358
62	Oct-04	0.0953	0.0594	0.0359
63	Nov-04	0.0911	0.0597	0.0314
64	Dec-04	0.0931	0.0592	0.0339
65	Jan-05	0.0933	0.0578	0.0355

Line No.	Date	DCF	Bond Yield	Risk Premium
66	Feb-05	0.0930	0.0561	0.0369
67	Mar-05	0.0925	0.0583	0.0342
68	Apr-05	0.0927	0.0564	0.0363
69	May-05	0.0922	0.0553	0.0368
70	Jun-05	0.0927	0.0540	0.0387
71	Jul-05	0.0913	0.0551	0.0362
72	Aug-05	0.0923	0.0550	0.0373
73	Sep-05	0.0950	0.0552	0.0398
74	Oct-05	0.0962	0.0579	0.0383
75	Nov-05	0.1005	0.0588	0.0417
76	Dec-05	0.1012	0.0580	0.0432
77	Jan-06	0.1015	0.0575	0.0440
78	Feb-06	0.1126	0.0582	0.0544
79	Mar-06	0.1111	0.0598	0.0513
80	Apr-06	0.1122	0.0629	0.0493
81	May-06	0.1118	0.0642	0.0476
82	Jun-06	0.1157	0.0640	0.0517
83	Jul-06	0.1151	0.0637	0.0514
84	Aug-06	0.1138	0.0620	0.0518
85	Sep-06	0.1164	0.0600	0.0564
86	Oct-06	0.1154	0.0598	0.0556
87	Nov-06	0.1158	0.0580	0.0578
88	Dec-06	0.1145	0.0581	0.0564
89	Jan-07	0.1120	0.0596	0.0524
90	Feb-07	0.1110	0.0590	0.0520
91	Mar-07	0.1120	0.0585	0.0535
92	Apr-07	0.1074	0.0597	0.0477
93	May-07	0.1108	0.0599	0.0509
94	Jun-07	0.1161	0.0630	0.0531
95	Jul-07	0.1179	0.0625	0.0554
96	Aug-07	0.1169	0.0624	0.0545
97	Sep-07	0.1181	0.0618	0.0563
98	Average	0.1131	0.0681	0.0450

Notes: Utility bond yield information from *Mergent Bond Record* (formerly Moody's). See Appendix 3 for a description of my ex ante risk premium approach. DCF results are calculated using a quarterly DCF model as follows:

d_0	=	Latest quarterly dividend per Value Line
P_0	=	Average of the monthly high and low stock prices for each month per Thomson Financial
FC	=	Flotation costs expressed as percent of gross proceeds (5%).
g	=	I/B/E/S forecast of future earnings growth for each month.
k	=	Cost of equity using the quarterly version of the DCF model.

$$k = \left[\frac{d_0 (1+g)^{\frac{1}{4}}}{P_0 - FC} + (1+g)^{\frac{1}{4}} \right]^4 - 1$$

SCHEDULE 4
COMPARATIVE RETURNS ON S&P 500 STOCK INDEX AND MOODY'S A-RATED UTILITY BONDS 1937 - 2007

Line No.	Year	S&P 500 Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
1	2007	1424.161	0.0181		$72.91	
2	2006	1,278.72	0.0183	13.20%	$75.25	2.20%
3	2005	1,181.41	0.0177	10.01%	$74.91	5.80%
4	2004	1,132.52	0.0162	5.94%	$70.87	11.34%
5	2003	895.84	0.0180	28.22%	$62.26	20.27%
6	2002	1,140.21	0.0138	-20.05%	$57.44	15.35%
7	2001	1,335.63	0.0116	-13.47%	$56.40	8.93%
8	2000	1,425.59	0.0118	-5.13%	$52.60	14.82%
9	1999	1,248.77	0.0130	15.46%	$63.03	-10.20%
10	1998	963.35	0.0162	31.25%	$62.43	7.38%
11	1997	766.22	0.0195	27.68%	$56.62	17.32%
12	1996	614.42	0.0231	27.02%	$60.91	-0.48%
13	1995	465.25	0.0287	34.93%	$50.22	29.26%
14	1994	472.99	0.0269	1.05%	$60.01	-9.65%
15	1993	435.23	0.0288	11.56%	$53.13	20.48%
16	1992	416.08	0.0290	7.50%	$49.56	15.27%
17	1991	325.49	0.0382	31.65%	$44.84	19.44%
18	1990	339.97	0.0341	-0.85%	$45.60	7.11%
19	1989	285.41	0.0364	22.76%	$43.06	15.18%
20	1988	250.48	0.0366	17.61%	$40.10	17.36%
21	1987	264.51	0.0317	-2.13%	$48.92	-9.84%
22	1986	208.19	0.0390	30.95%	$39.98	32.36%
23	1985	171.61	0.0451	25.83%	$32.57	35.05%
24	1984	166.39	0.0427	7.41%	$31.49	16.12%
25	1983	144.27	0.0479	20.12%	$29.41	20.65%
26	1982	117.28	0.0595	28.96%	$24.48	36.48%
27	1981	132.97	0.0480	-7.00%	$29.37	-3.01%
28	1980	110.87	0.0541	25.34%	$34.69	-3.81%
29	1979	99.71	0.0533	16.52%	$43.91	-

Line No.	Year	S&P 500 Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
						11.89%
30	1978	90.25	0.0532	15.80%	$49.09	-2.40%
31	1977	103.80	0.0399	-9.06%	$50.95	4.20%
32	1976	96.86	0.0380	10.96%	$43.91	25.13%
33	1975	72.56	0.0507	38.56%	$41.76	14.75%
34	1974	96.11	0.0364	-20.86%	$52.54	-12.91%
35	1973	118.40	0.0269	-16.14%	$58.51	-3.37%
36	1972	103.30	0.0296	17.58%	$56.47	10.69%
37	1971	93.49	0.0332	13.81%	$53.93	12.13%
38	1970	90.31	0.0356	7.08%	$50.46	14.81%
39	1969	102.00	0.0306	-8.40%	$62.43	-12.76%
40	1968	95.04	0.0313	10.45%	$66.97	-0.81%
41	1967	84.45	0.0351	16.05%	$78.69	-9.81%
42	1966	93.32	0.0302	-6.48%	$86.57	-4.48%
43	1965	86.12	0.0299	11.35%	$91.40	-0.91%
44	1964	76.45	0.0305	15.70%	$92.01	3.68%
45	1963	65.06	0.0331	20.82%	$93.56	2.61%
46	1962	69.07	0.0297	-2.84%	$89.60	8.89%
47	1961	59.72	0.0328	18.94%	$89.74	4.29%
48	1960	58.03	0.0327	6.18%	$84.36	11.13%
49	1959	55.62	0.0324	7.57%	$91.55	-3.49%
50	1958	41.12	0.0448	39.74%	$101.22	-5.60%
51	1957	45.43	0.0431	-5.18%	$100.70	4.49%
52	1956	44.15	0.0424	7.14%	$113.00	-7.35%
53	1955	35.60	0.0438	28.40%	$116.77	0.20%
54	1954	25.46	0.0569	45.52%	$112.79	7.07%
55	1953	26.18	0.0545	2.70%	$114.24	2.24%
56	1952	24.19	0.0582	14.05%	$113.41	4.26%
57	1951	21.21	0.0634	20.39%	$123.44	-4.89%
58	1950	16.88	0.0665	32.30%	$125.08	1.89%
59	1949	15.36	0.0620	16.10%	$119.82	7.72%
60	1948	14.83	0.0571	9.28%	$118.50	4.49%
61	1947	15.21	0.0449	1.99%	$126.02	-2.79%

Line No.	Year	S&P 500 Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
62	1946	18.02	0.0356	-12.03%	$126.74	2.59%
63	1945	13.49	0.0460	38.18%	$119.82	9.11%
64	1944	11.85	0.0495	18.79%	$119.82	3.34%
65	1943	10.09	0.0554	22.98%	$118.50	4.49%
66	1942	8.93	0.0788	20.87%	$117.63	4.14%
67	1941	10.55	0.0638	-8.98%	$116.34	4.55%
68	1940	12.30	0.0458	-9.65%	$112.39	7.08%
69	1939	12.50	0.0349	1.89%	$105.75	10.05%
70	1938	11.31	0.0784	18.36%	$99.83	9.94%
71	1937	17.59	0.0434	-31.36%	$103.18	0.63%
72	S&P 500 Return 1937--2006		11.58%			
73	A-rated Utility Bond Return		6.40%			
74	Risk Premium		5.18%			

Note: See Appendix 5 for an explanation of how stock and bond returns are derived and the source of the data presented.

SCHEDULE 5
COMPARATIVE RETURNS ON S&P UTILITY STOCK INDEX AND MOODY'S A-RATED UTILITY BONDS 1937 - 2007

Line No.	Year	S&P Utility Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
1	2007				$72.91	
2	2006			20.76%	$75.25	2.20%
3	2005			16.05%	$74.91	5.80%
4	2004			22.84%	$70.87	11.34%
5	2003			23.48%	$62.26	20.27%
6	2002			-14.73%	$57.44	15.35%
7						
8	2002	243.79	0.0362		$57.44	
9	2001	307.70	0.0287	-17.90%	$56.40	8.93%
10	2000	239.17	0.0413	32.78%	$52.60	14.82%
11	1999	253.52	0.0394	-1.72%	$63.03	-10.20%
12	1998	228.61	0.0457	15.47%	$62.43	7.38%
13	1997	201.14	0.0492	18.58%	$56.62	17.32%
14	1996	202.57	0.0454	3.83%	$60.91	-0.48%
15	1995	153.87	0.0584	37.49%	$50.22	29.26%
16	1994	168.70	0.0496	-3.83%	$60.01	-9.65%
17	1993	159.79	0.0537	10.95%	$53.13	20.48%
18	1992	149.70	0.0572	12.46%	$49.56	15.27%
19	1991	138.38	0.0607	14.25%	$44.84	19.44%
20	1990	146.04	0.0558	0.33%	$45.60	7.11%
21	1989	114.37	0.0699	34.68%	$43.06	15.18%
22	1988	106.13	0.0704	14.80%	$40.10	17.36%
23	1987	120.09	0.0588	-5.74%	$48.92	-9.84%
24	1986	92.06	0.0742	37.87%	$39.98	32.36%
25	1985	75.83	0.0860	30.00%	$32.57	35.05%
26	1984	68.50	0.0925	19.95%	$31.49	16.12%
27	1983	61.89	0.0948	20.16%	$29.41	20.65%

Line No.	Year	S&P Utility Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
28	1982	51.81	0.1074	30.20%	$24.48	36.48%
29	1981	52.01	0.0978	9.40%	$29.37	-3.01%
30	1980	50.26	0.0953	13.01%	$34.69	-3.81%
31	1979	50.33	0.0893	8.79%	$43.91	-11.89%
32	1978	52.40	0.0791	3.96%	$49.09	-2.40%
33	1977	54.01	0.0714	4.16%	$50.95	4.20%
34	1976	46.99	0.0776	22.70%	$43.91	25.13%
35	1975	38.19	0.0920	32.24%	$41.76	14.75%
36	1974	48.60	0.0713	-14.29%	$52.54	-12.91%
37	1973	60.01	0.0556	-13.45%	$58.51	-3.37%
38	1972	60.19	0.0542	5.12%	$56.47	10.69%
39	1971	63.43	0.0504	-0.07%	$53.93	12.13%
40	1970	55.72	0.0561	19.45%	$50.46	14.81%
41	1969	68.65	0.0445	-14.38%	$62.43	-12.76%
42	1968	68.02	0.0435	5.28%	$66.97	-0.81%
43	1967	70.63	0.0392	0.22%	$78.69	-9.81%
44	1966	74.50	0.0347	-1.72%	$86.57	-4.48%
45	1965	75.87	0.0315	1.34%	$91.40	-0.91%
46	1964	67.26	0.0331	16.11%	$92.01	3.68%
47	1963	63.35	0.0330	9.47%	$93.56	2.61%
48	1962	62.69	0.0320	4.25%	$89.60	8.89%
49	1961	52.73	0.0358	22.47%	$89.74	4.29%
50	1960	44.50	0.0403	22.52%	$84.36	11.13%
51	1959	43.96	0.0377	5.00%	$91.55	-3.49%
52	1958	33.30	0.0487	36.88%	$101.22	-5.60%
53	1957	32.32	0.0487	7.90%	$100.70	4.49%
54	1956	31.55	0.0472	7.16%	$113.00	-7.35%
55	1955	29.89	0.0461	10.16%	$116.77	0.20%
56	1954	25.51	0.0520	22.37%	$112.79	7.07%
57	1953	24.41	0.0511	9.62%	$114.24	2.24%
58	1952	22.22	0.0550	15.36%	$113.41	4.26%
59	1951	20.01	0.0606	17.10%	$123.44	-4.89%

Line No.	Year	S&P Utility Stock Price	Stock Dividend Yield	Stock Return	Bond Price	Bond Return
60	1950	20.20	0.0554	4.60%	$125.08	1.89%
61	1949	16.54	0.0570	27.83%	$119.82	7.72%
62	1948	16.53	0.0535	5.41%	$118.50	4.49%
63	1947	19.21	0.0354	-10.41%	$126.02	-2.79%
64	1946	21.34	0.0298	-7.00%	$126.74	2.59%
65	1945	13.91	0.0448	57.89%	$119.82	9.11%
66	1944	12.10	0.0569	20.65%	$119.82	3.34%
67	1943	9.22	0.0621	37.45%	$118.50	4.49%
68	1942	8.54	0.0940	17.36%	$117.63	4.14%
69	1941	13.25	0.0717	-28.38%	$116.34	4.55%
70	1940	16.97	0.0540	-16.52%	$112.39	7.08%
71	1939	16.05	0.0553	11.26%	$105.75	10.05%
72	1938	14.30	0.0730	19.54%	$99.83	9.94%
73	1937	24.34	0.0432	-36.93%	$103.18	0.63%
74	Return 1937--2006	Stocks	10.91%			
75		Bonds	6.40%			
76	Risk Premium		4.51%			

See Appendix 5 for an explanation of how stock and bond returns are derived and the source of the data presented. Standard & Poor's discontinued its S&P Utilities Index in December 2001 and replaced its utilities stock index with separate indices for electric and natural gas utilities. In this study, the stock returns beginning in 2002 are based on the total returns for the EEI Index of U.S. shareholder-owned electric utilities, as reported by EEI on its website. http://www.eei.org/industry_issues/finance_and_accounting/finance/research_and_analysis/EEI_Stock_Index

SCHEDULE 6
ANALYSIS OF TRENDS IN
RISK PREMIUM DATA 1936 - 2007

REGRESSION OUTPUT FOR RISK PREMIUM ON S&P 500

Line No.		Intercept	Time	Adjusted R Square	F
1	Coefficient	1.334	0.001	0.006	0.488
2	T Statistic	0.726	-0.698		

REGRESSION OUTPUT FOR RISK PREMIUM ON S&P UTILITIES

Line No.		Intercept	Time	Adjusted R Square	F
1	Coefficient	0.416	-0.000	0.370	1.25
2	T Statistic	0.234	-0.211		

SCHEDULE 7
USING THE ARITHMETIC MEAN TO ESTIMATE THE COST OF EQUITY CAPITAL

Consider an investment that in a given year generates a return of 30 percent with probability equal to .5 and a return of -10 percent with a probability equal to .5. For each one dollar invested, the possible outcomes of this investment at the end of year one are:

Ending Wealth	Probability
$1.30	0.50
$0.90	0.50

At the end of year two, the possible outcomes are:

Ending Wealth			Probability	Value x Probability
(1.30) (1.30)	=	$1.69	0.25	0.4225
(1.30) (.9)	=	$1.17	0.50	0.5850
(.9) (.9)	=	$0.81	0.25	0.2025
Expected Wealth	=			$1.21

The expected value of this investment at the end of year two is $1.21. In a competitive capital market, the cost of equity is equal to the expected rate of return on an investment. In the above example, the cost of equity is that rate of return which will make the initial investment of one dollar grow to the expected value of $1.21 at the end of two years. Thus, the cost of equity is the solution to the equation:

$$1(1+k)^2 = 1.21 \text{ or}$$

$$k = (1.21/1)^{.5} - 1 = 10\%.$$

The arithmetic mean of this investment is:

$$(30\%)\ (.5) + (-10\%)\ (.5) = 10\%.$$

Thus, the arithmetic mean is equal to the cost of equity capital.

The geometric mean of this investment is:

$$[(1.3)\ (.9)]^{.5} - 1 = .082 = 8.2\%.$$

Thus, the geometric mean is not equal to the cost of equity capital. The lesson is obvious: for an investment with an uncertain outcome, the arithmetic mean is the best measure of the cost of equity capital.

SCHEDULE 8
CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY
USING MORNINGSTAR 7.1 PERCENT RISK PREMIUM

Line			
1	Risk-free Rate	4.84%	Long-term (20-year) Treasury bond yield
2	Beta	0.91	Average Beta Proxy Companies (see following)
3	Risk Premium	7.10%	Long-horizon Morningstar risk premium
4	Beta x Risk Premium	6.46%	
5	Flotation Cost	0.20%	
6	CAPM cost of equity	11.5%	

Average Treasury bond yield September 2007, Federal Reserve. Morningstar risk premium from *Stocks, Bonds, Bills, and Inflation 2007 Yearbook Valuation Edition*; Value Line beta for proxy companies from Value Line Investment Analyzer October 2007.

PROXY COMPANY BETAS

Line No.	Company	Beta	Market Cap $ (Mil)
1	Alliant Energy	0.90	4,346
2	Amer. Elec. Power	1.15	18,926
3	Ameren Corp.	0.80	11,086
4	Black Hills	1.10	1,649
5	CenterPoint Energy	0.70	5,290
6	Consol. Edison	0.70	12,763
7	Dominion Resources	1.05	29,838
8	DPL Inc.	0.90	3,005
9	DTE Energy	0.80	8,266
10	Edison Int'l	1.05	18,210
11	Entergy Corp.	0.85	21,640
12	Exelon Corp.	0.90	50,523
13	FirstEnergy Corp.	0.90	19,759
14	FPL Group	0.80	25,329
15	G't Plains Energy	0.85	2,491
16	Integrys Energy	0.85	3,943
17	MDU Resources	0.85	5,097
18	Northeast Utilities	0.85	4,418
19	NSTAR	0.75	3,748
20	Otter Tail Corp.	0.75	1,082
21	Pepco Holdings	0.90	5,302
22	PG&E Corp.	0.95	17,092
23	Pinnacle West Capital	1.00	4,080
24	PNM Resources	0.95	1,849
25	PPL Corp.	0.95	18,274
26	Progress Energy	0.95	12,267
27	Puget Energy Inc.	0.80	2,857
29	Sempra Energy	1.00	15,398
30	Southern Co.	0.75	27,912
31	Westar Energy	0.90	2,309
32	Wisconsin Energy	0.80	5,304

Line No.	Company	Beta	Market Cap $ (Mil)
33	Xcel Energy Inc.	1.05	9,216
34	Market-Wtd. Ave.	0.91	

Data from Value Line Investment Analyzer October 2007. . Market capitalization from Thomson Financial, October 2007 (see Schedule 8).

SCHEDULE 9
CALCULATION OF CAPITAL ASSET PRICING MODEL COST OF EQUITY USING DCF ESTIMATE OF THE EXPECTED RATE OF RETURN ON THE MARKET PORTFOLIO

Line No.			
	Risk-free rate	4.84%	20-year Treasury bond yield
1	Beta	0.91	Average Beta Proxy Electric Companies
2	DCF S&P 500	13.7%	DCF Cost of Equity S&P 500 (see following)
3	Risk Premium	8.86%	
4	Beta x Risk Premium	8.06%	
5	Flotation Cost	0.20%	
5	CAPM cost of equity	13.1%	

Average Treasury bond yield September 2007, Federal Reserve. Value Line beta for proxy companies from Value Line Investment Analyzer October 2007.

SUMMARY OF DISCOUNTED CASH FLOW ANALYSIS FOR S&P 500 COMPANIES

COMPANY	P_0	D_0	Growth	Cost of Equity
3M	89.22	1.92	11.38%	13.8%
ABBOTT LABS.	52.90	1.30	11.98%	14.8%
ACE	58.79	1.08	13.23%	15.3%
AETNA	49.13	0.04	15.72%	15.8%
AIR PRDS.& CHEMS.	87.70	1.52	11.54%	13.5%
ALCOA	37.91	0.68	13.36%	15.4%
ALLEGHENY TECHS.	101.68	0.52	14.33%	14.9%
ALLSTATE	55.72	1.52	9.27%	12.3%
AMBAC FINANCIAL	68.61	0.84	11.33%	12.7%
AMER.STANDARD	37.52	0.45	11.67%	13.0%
AMEREN	50.74	2.54	7.30%	12.8%
AMERICAN EXPRESS	60.54	0.60	12.18%	13.3%
AMERICAN INTL.GP.	65.62	0.80	12.57%	13.9%
AMERIPRISE FINL.	60.68	0.60	11.04%	12.1%
AMERISOURCEBERGEN	46.57	0.19	14.00%	14.5%
APPLERA APPD.BIOS.	32.21	0.17	11.64%	12.2%
AVON PRODUCTS	35.68	0.74	10.33%	12.6%
BALL	52.07	0.40	12.50%	13.4%
BANK OF AMERICA	49.49	2.56	7.13%	12.8%
BANK OF NEW YORK MELLON	42.96	0.96	10.71%	13.2%
BARD C R	82.27	0.60	14.28%	15.1%
BAXTER INTL.	53.85	0.67	12.99%	14.4%
BB & T	39.89	1.84	8.81%	13.9%
BEAR STEARNS	120.20	1.28	10.93%	12.1%
BECTON DICKINSON	77.49	0.98	12.68%	14.1%
BEMIS	30.24	0.84	10.00%	13.1%
BROWN-FORMAN 'B'	71.64	1.21	11.17%	13.1%
BRUNSWICK	26.55	0.60	9.80%	12.3%
BURL.NTHN.SANTA FE	83.04	1.28	13.90%	15.7%
CATERPILLAR	77.89	1.44	12.78%	14.9%

COMPANY	P_0	D_0	Growth	Cost of Equity
CBS 'B'	31.95	1.00	8.86%	12.3%
CENTERPOINT EN.	16.54	0.68	11.00%	15.6%
CIGNA	50.98	0.04	12.69%	12.8%
CINTAS	37.39	0.39	13.00%	14.2%
CIT GP.	41.62	1.00	9.90%	12.6%
CITIGROUP	47.98	2.16	9.05%	14.0%
CLEAR CHL.COMMS.	36.67	0.75	10.61%	12.9%
CLOROX	60.81	1.60	10.61%	13.5%
COCA COLA	54.38	1.36	9.40%	12.2%
COLGATE-PALM.	67.55	1.44	10.41%	12.8%
COM.BANC.	36.45	0.52	11.01%	12.6%
CONOCOPHILLIPS	82.83	1.64	9.92%	12.1%
COOPER INDS.	52.05	0.84	12.75%	14.6%
COSTCO WHOLESALE	54.37	0.58	12.85%	14.1%
COUNTRYWIDE FINL.	24.70	0.60	11.42%	14.2%
D R HORTON	16.61	0.60	9.67%	13.7%
DONNELLEY R R & SONS	38.75	1.04	9.67%	12.6%
DOW CHEMICALS	43.23	1.68	11.58%	16.0%
DOW JONES & CO	56.92	1.00	12.78%	14.8%
EATON	94.66	1.72	11.37%	13.4%
ECOLAB	42.78	0.46	14.33%	15.6%
EL PASO	16.70	0.16	11.25%	12.3%
EMERSON ELECTRIC	48.49	1.05	12.50%	15.0%
ENTERGY	103.19	3.00	9.80%	13.0%
EQUIFAX	39.72	0.16	12.33%	12.8%
EXELON	73.93	1.76	9.64%	12.3%
FAMILY DOLLAR STORES	29.29	0.46	12.86%	14.6%
FEDERATED INVRS.'B'	36.53	0.84	12.25%	14.9%
FEDEX	108.85	0.40	14.49%	14.9%
FIDELITY NAT.INFO.SVS.	49.38	0.20	14.79%	15.3%
FIFTH THIRD BANCORP	37.51	1.68	8.94%	13.9%

COMPANY	P_0	D_0	Growth	Cost of Equity
FIRST HORIZON NATIONAL	31.62	1.80	7.00%	13.2%
FPL GROUP	59.63	1.64	9.29%	12.3%
FRANK.RES.	129.41	0.60	13.72%	14.2%
GAP	17.80	0.32	11.30%	13.3%
GENERAL DYNAMICS	79.23	1.16	10.91%	12.5%
GENERAL ELECTRIC	39.32	1.12	10.64%	13.8%
GENUINE PARTS	48.96	1.46	9.33%	12.6%
GENWORTH FINANCIAL	30.47	0.40	10.80%	12.3%
GOLDMAN SACHS GP.	193.76	1.40	13.13%	13.9%
GRAINGER W W	89.21	1.40	12.68%	14.5%
H & R BLOCK	20.51	0.57	12.33%	15.5%
HARLEY-DAVIDSON	55.46	1.20	11.40%	13.8%
HESS	61.65	0.40	12.03%	12.8%
HEWLETT-PACKARD	47.68	0.32	13.94%	14.7%
HOME DEPOT	36.31	0.90	12.40%	15.2%
HONEYWELL INTL.	57.47	1.00	10.25%	12.2%
HUNTINGTON BCSH.	18.79	1.06	6.00%	12.1%
ILLINOIS TOOL WKS.	56.11	1.12	12.27%	14.5%
IMS HEALTH	29.85	0.12	12.09%	12.5%
INGERSOLL-RAND	51.03	0.72	10.59%	12.2%
INTERNATIONAL BUS.MACH.	112.94	1.60	10.79%	12.4%
ITT	66.07	0.56	13.00%	14.0%
JOHNSON CONTROLS	37.87	0.44	13.75%	15.1%
JONES APPAREL GROUP	22.63	0.56	10.86%	13.6%
JP MORGAN CHASE & CO.	45.95	1.52	9.63%	13.3%
L3 COMMUNICATIONS	98.58	1.00	13.80%	15.0%
LEGG MASON	89.46	0.96	14.05%	15.3%
LENNAR 'A'	30.44	0.64	11.17%	13.5%
LINCOLN NAT.	62.48	1.58	10.36%	13.2%
LOCKHEED MARTIN	99.46	1.68	11.52%	13.4%

COMPANY	P_0	D_0	Growth	Cost of Equity
MACY'S	35.01	0.52	12.67%	14.4%
MANOR CARE	62.67	0.68	14.40%	15.6%
MARATHON OIL	55.51	0.96	10.79%	12.7%
MARRIOTT INTL.'A'	43.30	0.30	15.13%	15.9%
MARSHALL & ILSLEY	44.44	1.24	9.40%	12.5%
MATTEL	23.54	0.65	9.17%	12.2%
MBIA	58.97	1.36	10.33%	12.9%
MCDONALDS	50.69	1.50	8.92%	12.2%
MCGRAW-HILL	56.20	0.82	12.17%	13.8%
MCKESSON	57.64	0.24	14.56%	15.0%
MEDTRONIC	53.21	0.50	13.71%	14.8%
MERCK & CO.	50.79	1.52	10.55%	13.9%
MERRILL LYNCH & CO.	75.99	1.40	11.17%	13.2%
MGIC INVT	38.20	1.00	10.80%	13.7%
MICROSOFT	29.42	0.44	11.52%	13.2%
MOLSON COORS BREWING 'B'	45.65	0.64	10.91%	12.5%
MOODYS	52.41	0.32	13.80%	14.5%
MORGAN STANLEY	64.54	1.08	13.57%	15.5%
MYLAN	15.91	0.24	12.60%	14.3%
NATIONAL CITY	28.84	1.64	8.50%	14.8%
NATIONAL SEMICON.	26.46	0.24	11.93%	12.9%
NEWELL RUBBERMAID	27.04	0.84	9.00%	12.4%
NIKE 'B'	56.93	0.74	13.50%	15.0%
NORDSTROM	48.32	0.54	11.88%	13.1%
NORTHERN TRUST	63.86	1.00	11.93%	13.7%
NORTHROP GRUMMAN	77.85	1.48	13.25%	15.4%
OCCIDENTAL PTL.	58.58	1.00	11.14%	13.0%
OMNICOM GP.	51.61	0.60	11.90%	13.2%
PACCAR	84.63	0.72	11.74%	12.7%
PEPSICO	68.08	1.50	11.23%	13.7%
PERKINELMER	27.67	0.28	14.25%	15.4%
PG & E	45.23	1.44	8.88%	12.4%
PNC FINL.SVS.GP.	69.96	2.52	9.11%	13.1%
PPG INDUSTRIES	75.62	2.08	12.22%	15.3%

COMPANY	P_0	D_0	Growth	Cost of Equity
PPL	48.37	1.22	12.00%	14.9%
PRAXAIR	76.16	1.20	12.40%	14.2%
PRINCIPAL FINL.GP.	57.38	0.80	11.95%	13.5%
PROCTER & GAMBLE	64.86	1.40	11.31%	13.7%
PRUDENTIAL FINL.	91.07	0.95	13.56%	14.7%
QUEST DIAGNOSTICS	55.13	0.40	13.67%	14.5%
REGIONS FINL.NEW	31.47	1.44	7.14%	12.1%
RYDER SYSTEM	53.30	0.84	11.10%	12.9%
SAFECO	59.17	1.60	10.33%	13.3%
SEALED AIR	27.25	0.40	11.50%	13.1%
SNAP-ON	50.35	1.08	10.67%	13.1%
SOUTHWEST AIRLINES	15.44	0.02	14.40%	14.5%
SOVEREIGN BANC.	18.90	0.32	10.50%	12.4%
STANLEY WORKS	56.99	1.24	11.40%	13.8%
STATE STREET	66.71	0.88	13.00%	14.5%
SUNTRUST BANKS	80.06	2.92	8.26%	12.3%
SYNOVUS FINL.	28.69	0.82	11.60%	14.8%
T ROWE PRICE GP.	52.00	0.68	13.67%	15.2%
TEKTRONIX	32.28	0.24	14.17%	15.0%
TESORO	50.32	0.40	14.09%	15.0%
TEXTRON	57.45	0.46	14.00%	14.9%
THE TRAVELERS COS.	51.56	1.16	9.81%	12.3%
TIFFANY & CO	49.68	0.60	12.11%	13.5%
TIME WARNER	19.20	0.25	14.22%	15.7%
TJX COS.	29.37	0.36	12.39%	13.8%
TXU	66.10	1.73	10.20%	13.1%
TYCO ELECTRONICS	35.68	0.56	11.00%	12.8%
UNITED PARCEL SER.	75.45	1.68	12.04%	14.6%
UNITED TECHNOLOGIES	74.84	1.28	11.72%	13.6%
UNITEDHEALTH GP.	49.55	0.03	15.59%	15.7%
US BANCORP	31.77	1.60	7.88%	13.4%
V F	86.82	2.20	9.89%	12.7%
VERIZON COMMS.	42.15	1.72	7.77%	12.2%
WACHOVIA	49.26	2.56	8.65%	14.4%

COMPANY	P_0	D_0	Growth	Cost of Equity
WAL MART STORES	45.58	0.88	12.55%	14.7%
WALT DISNEY	33.75	0.30	14.52%	15.5%
WASTE MAN.	37.63	0.96	10.33%	13.2%
WELLS FARGO & CO	35.45	1.24	10.93%	14.9%
WENDY'S INTL.	33.83	0.50	12.59%	14.3%
WESTERN UNION	19.61	0.04	12.25%	12.5%
WRIGLEY WILLIAM JR.	59.64	1.16	10.45%	12.6%
WYNDHAM WORLDWIDE	33.01	0.16	12.50%	13.0%
XTO EN.	57.40	0.48	12.98%	13.9%
YUM! BRANDS	32.45	0.60	11.85%	13.9%
ZIONS BANCORP.	73.95	1.72	9.50%	12.1%
Market-weighted average				13.7%

Notes: In applying the DCF model to the S&P 500, I included in the DCF analysis only those companies in the S&P 500 group which pay a dividend, have a positive growth rate, and have at least three analysts' long-term growth estimates. I also eliminated those 25% of companies with the highest and lowest DCF results, a decision which had no impact on my CAPM estimate of the cost of equity.

D_0 = Current dividend per Thomson Financial.
P_0 = Average of the monthly high and low stock prices during the three months ending August 2007 per Thomson Financial.
FC = Flotation costs expressed as a percent of gross proceeds (5%).
g = I/B/E/S forecast of future earnings growth August 2007.
k = Cost of equity using the quarterly version of the DCF model shown below:

$$k = \left[\frac{d_0 (1+g)^{\frac{1}{4}}}{P_0 - FC} + (1+g)^{\frac{1}{4}} \right]^4 - 1$$

APPENDIX 1
QUALIFICATIONS OF JAMES H. VANDER WEIDE

JAMES H. VANDER WEIDE, Ph.D.
3606 Stoneybrook Drive
Durham, NC 27705
Tel. 919.383.6659 or 919.383.1057
jim.vanderweide@duke.edu

James H. Vander Weide is Research Professor of Finance and Economics at Duke University, the Fuqua School of Business. Dr. Vander Weide is also founder and President of Financial Strategy Associates, a consulting firm that provides strategic, financial, and economic consulting services to corporate clients, including cost of capital and valuation studies.

Educational Background and Prior Academic Experience

Dr. Vander Weide holds a Ph.D. in Finance from Northwestern University and a Bachelor of Arts from Cornell University. He joined the faculty at Duke University and was named Assistant Professor, Associate Professor, Professor, and then Research Professor of Finance and Economics.

Since joining the faculty at Duke, Dr. Vander Weide has taught courses in corporate finance, investment management, and management of financial institutions. He has also taught courses in statistics, economics, and operations research, and a Ph.D. seminar on the theory of public utility pricing. In addition, Dr. Vander Weide has been active in executive education at Duke and Duke Corporate Education, leading executive development seminars on topics including financial analysis, cost of capital, creating shareholder value, mergers

and acquisitions, real options, capital budgeting, cash management, measuring corporate performance, valuation, short-run financial planning, depreciation policies, financial strategy, and competitive strategy. Dr. Vander Weide has designed and served as Program Director for several executive education programs, including the Advanced Management Program, Competitive Strategies in Telecommunications, and the Duke Program for Manager Development for managers from the former Soviet Union.

Publications

Dr. Vander Weide has written a book entitled *Managing Corporate Liquidity: An Introduction to Working Capital Management* published by John Wiley and Sons, Inc. He has also written a chapter titled, "Financial Management in the Short Run" for *The Handbook of Modern Finance*, and written research papers on such topics as portfolio management, capital budgeting, investments, the effect of regulation on the performance of public utilities, and cash management. His articles have been published in *American Economic Review, Financial Management, International Journal of Industrial Organization, Journal of Finance, Journal of Financial and Quantitative Analysis, Journal of Bank Research, Journal of Portfolio Management, Journal of Accounting Research, Journal of Cash Management, Management Science, Atlantic Economic Journal, Journal of Economics and Business,* and *Computers and Operations Research.*

Professional Consulting Experience

Dr. Vander Weide has provided financial and economic consulting services to firms in the electric, gas, insurance, telecommunications, and water industries for more than 25 years. He has testified on the cost of capital,

competition, risk, incentive regulation, forward-looking economic cost, economic pricing guidelines, depreciation, accounting, valuation, and other financial and economic issues in more than 375 cases before the United States Congress, the Canadian Radio-Television and Telecommunications Commission, the Federal Communications Commission, the National Telecommunications and Information Administration, the Federal Energy Regulatory Commission, the National Energy Board of Canada, the public service commissions of 40 states and the District of Columbia, the insurance commissions of five states, the Iowa State Board of Tax Review, North Carolina Property Tax Commission, and the National Association of Securities Dealers. In addition, he has testified as an expert witness in proceedings before the United States District Court for the District of New Hampshire; United States District Court for the Northern District of California; United States District Court for the District of Nebraska; United States District Court for the Eastern District of North Carolina; Superior Court of North Carolina, the United States Bankruptcy Court for the Southern District of West Virginia; and United States District Court for the Eastern District of Michigan. With respect to implementation of the Telecommunications Act of 1996, Dr. Vander Weide has testified in 30 states on issues relating to the pricing of unbundled network elements and universal service cost studies and has consulted with Bell Canada, Deutsche Telekom, and Telefónica on similar issues. He has also provided expert testimony on issues related to electric and natural gas restructuring. He has worked for Bell Canada/Nortel on a special task force to study the effects of vertical integration in the Canadian telephone industry and has worked for Bell Canada as an expert witness on the cost of capital. Dr. Vander Weide has provided consulting and expert witness testimony to the following companies:

Telecommunications Companies

ALLTEL and its subsidiaries	Ameritech (now AT&T new)
AT&T (old)	Verizon (Bell Atlantic) and subsidiaries
Bell Canada/Nortel	BellSouth and its subsidiaries
Centel and its subsidiaries	Cincinnati Bell (Broadwing)
Cisco Systems	Citizens Telephone Company
Concord Telephone Company	Contel and its subsidiaries
Deutsche Telekom	GTE and subsidiaries (now Verizon)
Heins Telephone Company	Lucent Technologies
Minnesota Independent Equal Access Corp.	NYNEX and its subsidiaries (Verizon)
Pacific Telesis and its subsidiaries	Phillips County Cooperative Tel. Co.
Pine Drive Cooperative Telephone Co. (SureWest)	Roseville Telephone Company
Siemens	SBC Communications (now AT&T new)
Sherburne Telephone Company	Southern New England Telephone
The Stentor Companies	Sprint/United and its subsidiaries
Telefónica	Union Telephone Company
Woodbury Telephone Company	United States Telephone Association
U S West (Qwest) (Windstream)	Valor Telecommunications

Electric, Gas, and Water Companies

Alcoa Power Generating, Inc.
Alliant Energy
Ameren
American Water Works
Central Illinois Public Service
Citizens Utilities
Consolidated Natural Gas and its subsidiaries
Dominion Resources
Duke Energy
Xcel Energy District Electric Company
Interstate Power Company
Iowa-American Water Company
Iowa-Illinois Gas and Electric
Iowa Southern
Kentucky-American Water Company
Kentucky Power Company
MidAmerican Energy and its subsidiaries
Nevada Power Company
NICOR
North Carolina Natural Gas
Northern Natural Gas Company
North Shore Gas
PacifiCorp
PG&E
Peoples Energy and its subsidiaries
The Peoples Gas, Light and Coke Co.
Progress Energy
Public Service Company of North Carolina
PSE&G
Sempra Energy
South Carolina Electric and Gas
Southern Company
Tennessee-American Water Company
TransCanada PipeLines Limited
United Cities Gas Company

Insurance Companies

Allstate
North Carolina Rate Bureau
United Services Automobile Association (USAA)
The Travelers Indemnity Company
Gulf Insurance Company

Other Professional Experience

Dr. Vander Weide conducts in-house seminars and training sessions on topics such as creating shareholder value, financial analysis, competitive strategy, cost of capital, real options, financial strategy, managing growth, mergers and acquisitions, valuation, measuring corporate performance, capital budgeting, cash management, and financial planning. Among the firms for whom he has designed and taught tailored programs and training sessions are

ABB Asea Brown Boveri, Accenture, Allstate, Ameritech, AT&T, Bell Atlantic/Verizon, BellSouth, Progress Energy/Carolina Power & Light, Contel, Fisons, GlaxoSmithKline, GTE, Lafarge, MidAmerican Energy, New Century Energies, Norfolk Southern, Pacific Bell Telephone, The Rank Group, Siemens, Southern New England Telephone, TRW, and Wolseley Plc.
Dr. Vander Weide has also hosted a nationally prominent conference/workshop on estimating the cost of capital. In 1989, at the request of Mr. Fuqua, Dr. Vander Weide designed the Duke Program for Manager Development for managers from the former Soviet Union, the first in the United States designed exclusively for managers from Russia and the former Soviet republics.

In the 1970's, Dr. Vander Weide helped found University Analytics, Inc., which at that time was one of the fastest growing small firms in the country. As an officer at University Analytics, he designed cash management models, databases, and software packages that are still used by most major U.S. banks in consulting with their corporate clients. Having sold his interest in University Analytics, Dr. Vander Weide now concentrates on strategic and financial consulting, academic research, and executive education.

Publications - Dr. James H. Vander Weide

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APPENDIX 2
DERIVATION OF THE QUARTERLY DCF MODEL

The simple DCF Model assumes that a firm pays dividends only at the end of each year. Since firms in fact pay dividends quarterly and investors appreciate the time value of money, the annual version of the DCF Model generally underestimates the value investors are willing to place on the firm's expected future dividend stream. In these workpapers, we review two alternative formulations of the DCF Model that allow for the quarterly payment of dividends.

When dividends are assumed to be paid annually, the DCF Model suggests that the current price of the firm's stock is given by the expression:

$$P_0 = \frac{D_1}{(1+k)} + \frac{D_2}{(1+k)^2} + \ldots + \frac{D_n + P_n}{(1+k)^n} \quad (1)$$

where

P_0	=	current price per share of the firm's stock,
$D_1, D_2,\ldots,D_n$	=	expected annual dividends per share on the firm's stock,
P_n	=	price per share of stock at the time investors expect to sell the stock, and
k	=	return investors expect to earn on alternative investments of the same risk, i.e., the investors' required rate of return.

Unfortunately, expression (1) is rather difficult to analyze, especially for the purpose of estimating k. Thus, most analysts make a number of simplifying assumptions. First, they assume that dividends are expected to grow at the constant rate g into the indefinite future. Second, they assume that the stock price at time n is simply the present value of all dividends expected in periods subsequent to n. Third, they assume that the investors' required rate of return, k, exceeds the expected dividend growth

rate g. Under the above simplifying assumptions, a firm's stock price may be written as the following sum:

$$P_0 = \frac{D_0(1+g)}{(1+k)} + \frac{D_0(1+g)^2}{(1+k)^2} + \frac{D_0(1+g)^3}{(1+k)^3} + \ldots, \qquad (2)$$

where the three dots indicate that the sum continues indefinitely.

As we shall demonstrate shortly, this sum may be simplified to:

$$P_0 = \frac{D_0(1+g)}{(k-g)}$$

First, however, we need to review the very useful concept of a geometric progression.

Geometric Progression

Consider the sequence of numbers 3, 6, 12, 24,…, where each number after the first is obtained by multiplying the preceding number by the factor 2. Obviously, this sequence of numbers may also be expressed as the sequence 3, 3 x 2, 3 x 2^2, 3 x 2^3, etc. This sequence is an example of a geometric progression.

Definition: A geometric progression is a sequence in which each term after the first is obtained by multiplying some fixed number, called the common ratio, by the preceding term.

A general notation for geometric progressions is: a, the first term, r, the common ratio, and n, the number of terms. Using this notation, any geometric progression may be represented by the sequence:

$$a, ar, ar^2, ar^3, \ldots, ar^{n-1}.$$

In studying the DCF Model, we will find it useful to have an expression for the sum of n terms of a geometric progression. Call this sum S_n. Then

$$S_n = a + ar + \ldots + ar^{n-1} . \qquad (3)$$

However, this expression can be simplified by multiplying both sides of equation (3) by r and then subtracting the new equation from the old. Thus,

$$rS_n = ar + ar^2 + ar^3 + \ldots + ar^n$$

and

$$S_n - rS_n = a - ar^n \quad ,$$

or

$$(1 - r)\, S_n = a\,(1 - r^n) \ .$$

Solving for S_n, we obtain:

$$S_n = \frac{a(1 - r^n)}{(1 - r)} \qquad (4)$$

as a simple expression for the sum of n terms of a geometric progression. Furthermore, if $|r| < 1$, then S_n is finite, and as n approaches infinity, S_n approaches a ÷ (1-r). Thus, for a geometric progression with an infinite number of terms and $|r| < 1$, equation (4) becomes:

$$S = \frac{a}{1 - r} \qquad (5)$$

Application to DCF Model

Comparing equation (2) with equation (3), we see that the firm's stock price (under the DCF assumption) is the sum of an infinite geometric progression with the first term

$$a = \frac{D_0(1 + g)}{(1 + k)}$$

and common factor

$$r = \frac{(1+g)}{(1+k)}$$

Applying equation (5) for the sum of such a geometric progression, we obtain

$$S = a \bullet \frac{1}{(1-r)} = \frac{D_0(1+g)}{(1+k)} \bullet \frac{1}{1-\frac{1+g}{1+k}} = \frac{D_0(1+g)}{(1+k)} \bullet \frac{1+k}{k-g} = \frac{D_0(1+g)}{k-g}$$

as we suggested earlier.

Quarterly DCF Model

The Annual DCF Model assumes that dividends grow at an annual rate of g% per year (see Figure 1).

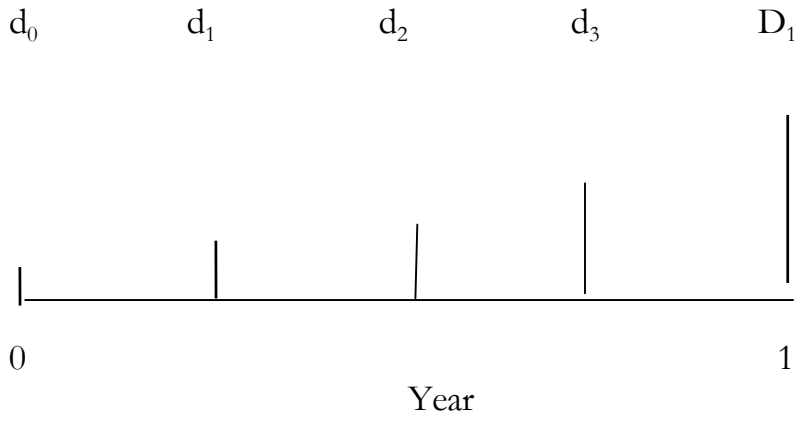
Figure 1

Annual DCF Model

$D_0 = 4d_0$ $D_1 = D_0(1 + g)$

Figure 2

Quarterly DCF Model (Constant Growth Version)



$d_1 = d_0(1+g)^{.25}$ $\qquad$ $d_2 = d_0(1+g)^{.50}$

$d_3 = d_0(1+g)^{.75}$ $\qquad$ $d_4 = d_0(1+g)$

In the Quarterly DCF Model, it is natural to assume that quarterly dividend payments differ from the preceding quarterly dividend by the factor $(1 + g)^{.25}$, where g is expressed in terms of percent per year and the decimal .25 indicates that the growth has only occurred for one quarter of the year. (See Figure 2.) Using this assumption, along with the assumption of constant growth and $\boldsymbol{k} > \boldsymbol{g}$, we obtain a new expression for the firm's stock price, which takes account of the quarterly payment of dividends. This expression is:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}}} + \frac{d_0(1+g)^{\frac{2}{4}}}{(1+k)^{\frac{2}{4}}} + \frac{d_0(1+g)^{\frac{3}{4}}}{(1+k)^{\frac{3}{4}}} + \ldots \qquad \textbf{(6)}$$

where d_0 is the last quarterly dividend payment, rather than the last annual dividend payment. (We use a lower case d to remind the reader that this is not the annual dividend.)

Although equation (6) looks formidable at first glance, it too can be greatly simplified using the formula [equation (4)] for the sum of an infinite geometric progression. As the reader can easily verify, equation (6) can be simplified to:

$$P_0 = \frac{d_0(1+g)^{\frac{1}{4}}}{(1+k)^{\frac{1}{4}} - (1+g)^{\frac{1}{4}}} \qquad \textbf{(7)}$$

Solving equation (7) for *k*, we obtain a DCF formula for estimating the cost of equity under the quarterly dividend assumption:

$$k = \left[\frac{d_0(1+g)^{\frac{1}{4}}}{P_0} + (1+g)^{\frac{1}{4}} \right]^4 - 1 \qquad \textbf{(8)}$$

An Alternative Quarterly DCF Model

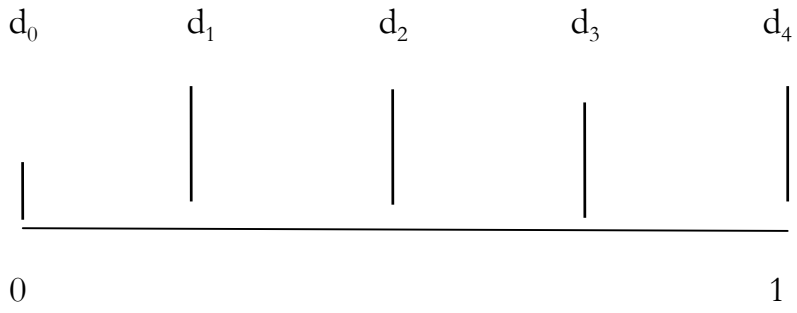
Although the constant growth Quarterly DCF Model [equation (8)] allows for the quarterly timing of dividend payments, it does require the assumption that the firm increases its dividend payments each quarter. Since this assumption is difficult for some analysts to accept, we now discuss a second Quarterly DCF Model that allows for constant quarterly dividend payments within each dividend year.

Assume then that the firm pays dividends quarterly and that each dividend payment is constant for four consecutive quarters. There are four cases to consider, with each case distinguished by varying assumptions about where we are evaluating the firm in relation to the time of its next dividend increase. (See Figure 3.)

Figure 3

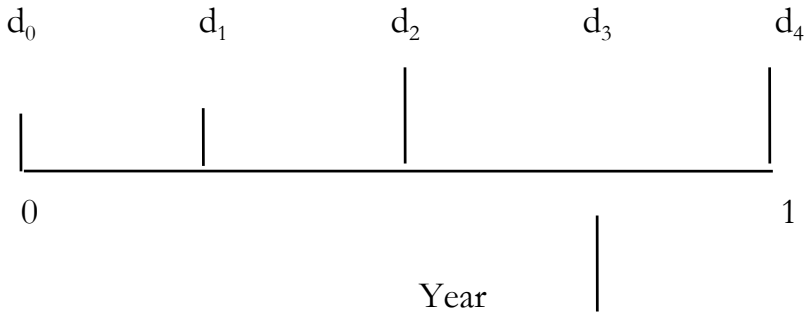
Quarterly DCF Model (Constant Dividend Version)

Case 1



$$d_1 = d_2 = d_3 = d_4 = d_0(1+g)$$

Case 2

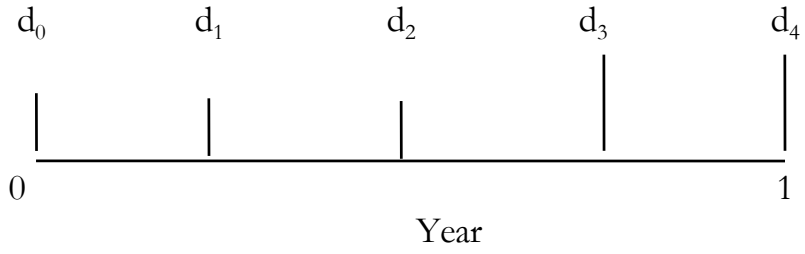


$$d_1 = d_0$$

$$d_2 = d_3 = d_4 = d_0(1+g)$$

Figure 3 (continued)

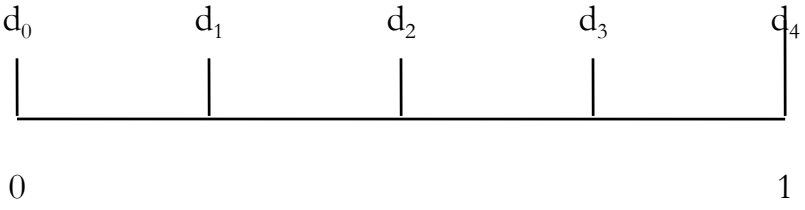
Case 3



$$d_1 = d_2 = d_0$$

$$d_3 = d_4 = d_0(1+g)$$

Case 4



$$d_1 = d_2 = d_3 = d_0$$

$$d_4 = d_0(1+g)$$

If we assume that the investor invests the quarterly dividend in an alternative investment of the same risk, then the amount accumulated by the end of the year will in all cases be given by

$$D_1^* = d_1 (1+k)^{3/4} + d_2 (1+k)^{1/2} + d_3 (1+k)^{1/4} + d_4$$

where d_1, d_2, d_3 and d_4 are the four quarterly dividends. Under these new assumptions, the firm's stock price may be expressed by an Annual DCF Model of the form (2), with the exception that

$$D_1^* = d_1 (1 + k)^{3/4} + d_2 (1 + k)^{1/2} + d_3 (1 + k)^{1/4} + d_4 \quad \textbf{(9)}$$

is used in place of $D_0(1+g)$. But, we already know that the Annual DCF Model may be reduced to

$$P_0 = \frac{D_0(1+g)}{k-g}$$

Thus, under the assumptions of the second Quarterly DCF Model, the firm's cost of equity is given by

$$k = \frac{D_1^*}{P_0} + g \quad \textbf{(10)}$$

with D_1^* given by (9).

Although equation (10) looks like the Annual DCF Model, there are at least two very important practical differences. First, since D_1^* is always greater than $D_0(1+g)$, the estimates of the cost of equity are always larger (and more accurate) in the Quarterly Model (10) than in the Annual Model. Second, since D_1^* depends on k through equation (9), the unknown "k" appears on both sides of (10), and an iterative procedure is required to solve for k.

APPENDIX 3
EX ANTE RISK PREMIUM APPROACH

My ex ante risk premium method is based on studies of the DCF expected return on proxy companies compared to the interest rate on Moody's A-rated utility bonds. Specifically, for each month in my study period, I calculate the risk premium using the equation,

$$RP_{PROXY} = DCF_{PROXY} - I_A$$

where:

RP_{PROXY}	=	the required risk premium on an equity investment in the proxy group of companies,
DCF_{PROXY}	=	average DCF estimated cost of equity on a portfolio of proxy companies; and
I_A	=	the yield to maturity on an investment in A-rated utility bonds.

For my ex ante risk premium analysis, I began with the Moody's group of 24 electric companies shown in Table 1. I used the Moody's group of electric companies because they are a widely followed group of electric utilities, and use of this constant group greatly simplified the data collection task required to estimate the ex ante risk premium over the months of my study. Simplifying the data collection task was desirable because the ex ante risk premium approach requires that the DCF model be estimated for every company in every month of the study period. The Ex Ante Risk Premium Schedule in my direct testimony displays the average DCF estimated cost of equity on an investment in the portfolio of electric companies and the yield to maturity on A-rated utility bonds in each month of the study.

Previous studies have shown that the ex ante risk premium tends to vary inversely with the level of interest rates, that is, the risk premium tends to increase

when interest rates decline, and decrease when interest rates go up. To test whether my studies also indicate that the ex ante risk premium varies inversely with the level of interest rates, I performed a regression analysis of the relationship between the ex ante risk premium and the yield to maturity on A-rated utility bonds, using the equation,

$$RP_{PROXY} = a + (b \times I_A) + e$$

where:

RP_{PROXY} = risk premium on proxy company group;

I_A = yield to maturity on A-rated utility bonds;

e = a random residual; and

a, b = coefficients estimated by the regression procedure.

Regression analysis assumes that the statistical residuals from the regression equation are random. My examination of the residuals revealed that there is a significant probability that the residuals are serially correlated (non-zero serial correlation indicates that the residual in one time period tends to be correlated with the residual in the previous time period). Therefore, I made adjustments to my data to correct for the possibility of serial correlation in the residuals.

The common procedure for dealing with serial correlation in the residuals is to estimate the regression coefficients in two steps. First, a multiple regression analysis is used to estimate the serial correlation coefficient, *r*. Second, the estimated serial correlation coefficient is used to transform the original variables into new variables whose serial correlation is approximately zero. The regression coefficients are then re-estimated using the transformed variables as inputs in the regression equation. Based on my knowledge of the statistical relationship between the yield to

maturity on A-rated utility bonds and the required risk premium, my estimate of the ex ante risk premium on an investment in my proxy electric company group as compared to an investment in A-rated utility bonds is given by the equation:

$$RP_{PROXY} = 0.0842 - .5505 \times I_A.$$

Using the 6.18 percent average yield to maturity on A-rated utility bonds as of September 2007, the regression equation produces an ex ante risk premium based on the electric proxy group equal to 5.02 percent (0.0842 – .5505 x 6.18 = 5.02).

To estimate the cost of equity using the ex ante risk premium method, one may add the estimated risk premium over the yield on A-rated utility bonds to the yield to maturity on A-rated utility bonds. As described above, my analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to 5.02 percent. Adding an estimated risk premium of 5.02 percent to the 6.18 percent average yield to maturity on A-rated utility bonds produces a cost of equity estimate of 11.2 percent for the electric company proxy group using the ex ante risk premium method.

TABLE 1

MOODY'S ELECTRIC COMPANIES

American Electric Power
Constellation Energy
Progress Energy
CH Energy Group
Cinergy Corp.
Consolidated Edison Inc.
DPL Inc.
DTE Energy Co.
Dominion Resources Inc.
Duke Energy Corp.
Energy East Corp.
FirstEnergy Corp.
Reliant Energy Inc.
IDACORP. Inc.
IPALCO Enterprises Inc.
NiSource Inc.
OGE Energy Corp.
Exelon Corp.
PPL Corp.
Potomac Electric Power Co.
Public Service Enterprise Group
Southern Company
Teco Energy Inc.
Xcel Energy Inc.

Source of data: Mergent Public Utility Manual, August 2002. Of these 24 companies, I did not include three companies in my ex ante risk premium DCF analysis because there was insufficient data to perform a DCF analysis for most of my study period. Specifically, IPALCO merged with a company that is not in the electric utility industry; Reliant divested its electric utility operations; and CH Energy does not have any I/B/E/S analysts' estimates of long-term growth.

APPENDIX 4
EX POST RISK PREMIUM APPROACH

Source of Data

Stock price and yield information is obtained from Standard & Poor's Security Price publication. Standard & Poor's derives the stock dividend yield by dividing the aggregate cash dividends (based on the latest known annual rate) by the aggregate market value of the stocks in the group. The bond price information is obtained by calculating the present value of a bond due in 30 years with a $4.00 coupon and a yield to maturity of a particular year's indicated Moody's A-rated Utility bond yield. The values shown on the ex post risk premium schedules are the January values of the respective indices.

Calculation of Stock and Bond Returns

Sample calculation of "Stock Return" column:

$$\text{Stock Return (2006)} = \left[\frac{\text{Stock Price (2007) - Stock Price (2006) + Dividend (2006)}}{\text{Stock Price (2006)}} \right]$$

where Dividend (2006) = Stock Price (2006) x Stock Div. Yield (2006)

Sample calculation of "Bond Return" column:

$$\text{Bond Return (2006)} = \left[\frac{\text{Bond Price (2007) - Bond Price (2006) + Interest (2006)}}{\text{Bond Price (2006)}} \right]$$

where Interest = $4.00.

STATE OF NORTH DAKOTA
BEFORE THE
PUBLIC SERVICE COMMISSION

In the Matter of the Application of Northern States Power Company, a Minnesota Corporation For Authority to Increase Rates for Electric Service in North Dakota	))))	Case No. PU-07-___

AFFIDAVIT OF
James H. Vander Weide, Ph.D.

I, the undersigned, being duly sworn, depose and say that the foregoing is the Direct Testimony of the undersigned, and that such Direct Testimony and the exhibits or schedules sponsored by me to the best of my knowledge, information and belief, are true, correct, accurate and complete, and I hereby adopt said testimony as if given by me in formal hearing, under oath.

James H. Vander Weide

James H. Vander Weide, Ph.D.

Subscribed and sworn to before me, this 4 day of December, 2007.

Amy C. Knudsen

Notary Public