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IOWA UTILITIES BOARD

STATE OF IOWA
DEPARTMENT OF COMMERCE
BEFORE THE IOWA STATE UTILITIES BOARD

IN RE:	:	
	:	
APPLICATION OF MIDAMERICAN ENERGY COMPANY FOR A DETERMINATION OF RATEMAKING PRINCIPLES	:	**DOCKET NO. RPU-2014-0002**

DIRECT TESTIMONY
OF
JAMES H. VANDER WEIDE, PH.D.

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I. INTRODUCTION AND PURPOSE

Q. Please state your name, title, and business address.

A. My name is James H. Vander Weide. I am 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 27705.

Q. Please describe your educational background and prior academic experience.

A. I graduated from Cornell University with a Bachelor's Degree in Economics and from Northwestern University with a Ph.D. in Finance. After joining the faculty of the School of Business at Duke University, I was named Assistant Professor, Associate Professor, Professor, and then Research Professor. I have published research in the areas of finance and economics and taught courses in these fields at Duke for more than 35 years. I am now retired from my teaching duties at Duke. A summary of my research, teaching, and other professional experience is presented in Appendix 1.

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 400 regulatory and legal proceedings before the public service commissions of 45 states and four Canadian provinces, the Federal Energy Regulatory Commission, the National Energy Board (Canada), the Federal Communications Commission, the Canadian Radio-Television and Telecommunications Commission, the U.S. Congress, the National Telecommunications and Information Administration, 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 prepared expert testimony 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 District of Northern Illinois; the U.S. District Court for the Eastern District of North Carolina; the Montana Second Judicial District Court, Silver Bow County; 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; the U. S. District Court for the Eastern District of Michigan; and the Supreme Court of the State of New York.

Q. Are you familiar with MidAmerican's application in this proceeding?

A. Yes. MidAmerican Energy Company (MidAmerican or the Company) is applying for a determination of advance ratemaking principles related to its proposed Wind IX Iowa Project (Wind IX) pursuant to Iowa Code § 476.53.

Q. What is the purpose of the advance ratemaking principles described in Iowa Code § 476.53?

A. The Iowa advance ratemaking principles are designed to:

> attract the development of electric power generating and transmission facilities within the state in sufficient quantity to ensure reliable electric service to Iowa consumers and provide economic benefits to the state. [Iowa Code § 476.53 subsection 1]

Q. What are some of the economic benefits Wind IX offers to Iowa?

A. Wind IX offers benefits such as: (1) low cost renewable energy for Iowa customers; (2) additional Iowa jobs and economic development opportunities; (3) diversifying MidAmerican's generation portfolio; (4) protecting customers

from potential increases in natural gas prices and the costs of satisfying more stringent carbon emission standards; and (5) additional rental payments to landowners for wind energy sites.

Q. Does the Iowa Code impose restrictions on how its intent to attract development of electric power generating and transmission facilities shall be implemented?

A. Yes. The Iowa Code states:

> The General Assembly's intent with regard to the development of electric power generating and transmission facilities within the state, as provided in subsection 1, shall be implemented in a manner that is cost effective and compatible with the environmental policies of the state, as expressed in Title XI." [Iowa Code § 476.53 subsection 2]

Q. Has MidAmerican provided evidence that Wind IX is both cost effective and compatible with the environmental policies of the state?

A. Yes. MidAmerican Witness Wright provides such evidence in his direct testimony. Witness Wright notes that key components of Wind IX are its cost effectiveness due to the availability of federal incentives for the development of renewable energy, including the federal production tax credit for wind energy facilities, and the positive environmental attributes associated with wind generation.

Q. Is MidAmerican proposing that the benefits of wind energy be used to reduce rates in this proceeding?

A. Yes. MidAmerican is proposing that customers receive the benefit of wind energy and its zero fuel cost in the energy adjustment clause.

Q. Does MidAmerican offer other assurance regarding the cost effectiveness of Wind IX?

A. Yes. To further assure the cost effectiveness of Wind IX, MidAmerican is proposing that: (1) there will be a cost cap as identified in the testimony of MidAmerican witness Adam Wright; and (2) there will be a depreciation life of thirty years.

Q. What risks does MidAmerican face in investing in Wind IX?

A. MidAmerican faces the risks of: (1) making large capital expenditures on long-lived physical generating assets at a time of uncertainty in energy prices, future environmental regulations, the relative economics of alternative generating facilities; and future demand for electricity; and (2) having a fixed rate of return over the life of the project.

Q. Is there risk in having a fixed rate of return over the thirty-year life of Wind IX?

A. Yes. Although current capital costs are relatively low, there is no assurance that capital costs will remain at current levels over the 30-year life of the project. For example, over the last 30 years, the average allowed return on equity for electric utilities has ranged between 10% and 16%, and long-term yields on 30-year A-rated utility bonds have ranged between 4% and 16%. Thus, if capital costs increase, MidAmerican faces the risk that its allowed return may be insufficient to recover capital costs.

Q. Iowa Code § 476.53 states that advance ratemaking principles are designed to attract the development of electric generating facilities and offer economic benefits to Iowa. What return on equity does MidAmerican request in its

proposed advance ratemaking principles for providing renewable energy electric generating facilities and economic benefits to Iowa customers?

A. MidAmerican is requesting an allowed rate of return on equity equal to 11.75% on Wind IX.

Q. What is the purpose of your testimony in this proceeding?

A. I have been asked by MidAmerican to prepare an independent appraisal of whether the Company's requested 11.75% rate of return on equity for its investment in its proposed Wind IX Iowa Project is fair and reasonable.

Q. How do you estimate the reasonableness of MidAmerican's requested 11.75% rate of return on equity for MidAmerican's investment in Wind IX?

A. I estimate the reasonableness of MidAmerican's requested 11.75% return on equity for its investment in Wind IX in two steps. First, I estimate MidAmerican's cost of equity by applying several standard cost of equity estimation methods to proxy groups of comparable utilities. Second, I assess an appropriate return differential for MidAmerican to invest in a clean energy project that satisfies the goals and intent of Iowa Code § 476.53.

Q. What is your conclusion regarding MidAmerican's cost of equity?

A. On the basis of my studies, I conclude that MidAmerican's cost of equity is approximately 10.6%.

Q. What is your conclusion regarding an appropriate allowed return on equity for MidAmerican to invest in Wind IX?

A. Based on my studies, I conclude that the allowed return on equity for an investment in Wind IX is approximately 100 to 150 basis points above my 10.6% estimate of MidAmerican's cost of equity.

Q. What is your conclusion regarding the reasonableness of MidAmerican's requested 11.75% return on equity for its investment in Wind IX?

A. Based on my estimate of MidAmerican's cost of equity and my analysis of the relationship between previous allowed rates of return on equity in advance ratemaking proceedings and interest rates, I conclude that MidAmerican's requested 11.75% return on equity for its investment in Wind IX is fair and reasonable.

Q. Do you have exhibits accompanying your testimony?

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

II. ECONOMIC AND LEGAL PRINCIPLES

Q. How do economists define the required rate of return, or cost of capital, associated with particular investment decisions such as the decision to invest in electric utility plant and equipment?

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 investing only in that plant and equipment where the expected rate of return is equal to or exceeds 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%, the cost of equity is 13%, and the percentages of debt and equity in the firm's capital structure are 50% and 50%, respectively. Then the weighted average cost of capital is expressed by 0.50 times 7% plus 0.50 times 13%, or 10.0%.

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 by first calculating 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 values 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% debt and 75% 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 and risk on their portfolios

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 and risk on their investment portfolios using market value weights rather than book value weights?

A. Investors measure the expected return and risk 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; (2) the risk of a portfolio is calculated by examining the variability of the return on the portfolio around its expected value; and (3) 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 regulators' traditional 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, regulators have traditionally defined the weighted average cost of capital using the embedded cost of debt and the book values of debt and equity in a company's capital structure.

Q. Will investors have an opportunity to earn a fair return on the value of their equity investment in the company if regulators calculate the weighted

average cost of capital using the book value of equity in the company's capital structure?

A. No. Investors will only have an opportunity to earn a fair return on the value of their equity investment if regulators either calculate the weighted average cost of capital using the market value of equity in the company's capital structure or adjust the cost of equity for the difference in the financial risk reflected in the market value capital structures of the proxy companies and the financial risk reflected in the company's ratemaking capital structure.

Q. Are the economic principles regarding the fair return for capital recognized in any United States Supreme court cases?

A. Yes. These economic principles, relating to the supply of and demand for capital, are 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. [*Bluefield Water Works and Improvement Co. v. Public Service Comm'n.* 262 U.S. 679, 692 (1923).]

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

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.

III. BUSINESS AND FINANCIAL RISKS

Q. How do investors estimate the expected rate of return on specific investments, such as an investment in MidAmerican?

A. Investors estimate the expected rate of return in several steps. First, they estimate the amount of their investment in the company. Second, they estimate the timing

and amounts of the cash flows they expect to receive from their investment over the life of the investment. Third, they determine the return, or discount rate, that equates the present value of the expected cash receipts from their investment in the company to the current value of their investment in the company.

Q. Are the returns on investment opportunities, such as an investment in MidAmerican, known with certainty at the time the investment is made?

A. No. As discussed above, the return on an investment in MidAmerican depends on the Company's expected future cash flows over the life of the investment. Since the Company's expected future cash flows are uncertain at the time the investment is made, the return on the investment is also uncertain.

Q. You mention that investors require a return on investment that is equal to the return they expect to receive on other investments of similar risk. Does the required return on an investment depend on 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. What fundamental risk do investors face when they invest in a company such as MidAmerican?

A. Investors face the fundamental risk that their realized, or actual, return on investment, will be less than their required return on investment.

Q. How do investors measure investment risk?

A. Investors generally measure investment risk by estimating the probability, or likelihood, of earning less than the required return on investment. For investments with potential returns distributed symmetrically about the expected, or mean,

return, investors can also measure investment risk by estimating the variance, or volatility, of the potential return on investment.

Q. Do investors distinguish between business and financial risk?

A. Yes. Business risk is the underlying risk that investors will earn less than their required return on investment when the investment is financed entirely with equity. Financial risk is the additional risk of earning less than the required return when the investment is financed with both fixed-cost debt and equity.

Q. What are the primary determinants of an electric utility's business risk?

A. The business risk of investing in electric utility companies such as MidAmerican is caused by: (1) demand uncertainty; (2) operating expense uncertainty; (3) investment cost uncertainty; (4) high operating leverage; and (5) regulatory uncertainty.

Q. What causes the demand for electricity to be uncertain?

A. Electric utilities experience demand uncertainty in both the short run and the long run. Short-run demand uncertainty is caused by the strong dependence of electric demand on the state of the economy and weather patterns. Long-run demand uncertainty is caused by: (a) the sensitivity of demand to changes in rates; (b) the efforts of customers to conserve energy; (c) the potential development of new energy efficient technologies and appliances; (d) the improved economics of distributed generation; and (e) the ability of some customers to co-generate their own electricity or purchase electricity from competitors.

Q. How does short-run demand uncertainty affect an electric utility's business risk?

A. Short-run demand uncertainty affects an electric utility's business risk through its impact on the variability of the company's revenues and its return on investment. The greater the short-run uncertainty in demand the greater is the uncertainty in the company's yearly revenues and return on investment.

Q. How does long-run demand uncertainty affect an electric utility's business risk?

A. Long-run demand uncertainty affects an electric utility's business risk through its impact on the utility's revenues over the life of its plant investments. Long-run demand uncertainty creates greater risk for electric utilities because investments in electric utility infrastructure are long-lived and irreversible. If demand turns out to be less than expected over the life of the investment, the utility may not be able to generate sufficient revenues over the life of the investment to cover its operating expenses and earn a fair return on its investment.

Q. Does MidAmerican experience demand uncertainty?

A. Yes. MidAmerican experiences demand uncertainty in both the short run and the long run. The Company experiences short-run demand uncertainty as a result of economic cycles, such as the recent recession, when fewer homes are built, fewer new businesses are started, and factories are running at less than full capacity; and as a result of weather patterns, such as unusually warm winters and cool summers. MidAmerican experiences long-run demand uncertainty when it invests in major long-lived plant additions or replacements that are expected to remain in service over the next 30 or 40 years. If future actual demand turns out to be less than forecast demand, the Company may not generate sufficient revenues to recover its investment and earn a fair return on its investment.

Q. Why are an electric utility's operating expenses uncertain?

A. Operating expense uncertainty arises as a result of factors such as: (a) high volatility in fuel prices or interruptions in fuel supply; (b) variability in maintenance costs and the costs of materials; (c) uncertainty over outages of the company's generation, transmission, and distribution systems, as well as storm-related expenses; (d) uncertainty regarding the cost of purchased power and the revenues achieved from off-system sales; (e) the prospect of increasing employee health care and pension expenses; and (f) the prospect of increased expenses for security.

Q. Does MidAmerican experience operating expense uncertainty?

A. Yes. MidAmerican experiences both the typical operating expense uncertainty associated with its existing operations and the operating expense uncertainty associated with the future operations of major plant additions.

Q. Why are utility investment costs uncertain?

A. The electric utility business requires large investments in the plant and equipment required to deliver electricity to customers. The future amounts of required investments in plant and equipment are 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; and (e) uncertainty in the amount of additional investments to ensure the reliability of the company's transmission and distribution networks. Furthermore, the risk of investing in electric utility facilities is increased by the irreversible nature of the company's investments in utility plant and equipment. For example, if an electric utility

decides to invest in a new generation project such as Wind IX and actual demand turns out to be less than forecasted demand, the company may not be able earn a fair return on equity, including both a return of and a return on capital.

Q. You note above that high operating leverage contributes to the business risk of electric utilities. What is operating leverage?

A. Operating leverage is the increased sensitivity of a company's earnings to sales variability that arises when some of the company's costs are fixed.

Q. How do economists measure operating leverage?

A. Economists typically measure operating leverage by the ratio of a company's fixed expenses to its operating margin (revenues minus variable expenses).

Q. What is the difference between fixed and variable expenses?

A. Fixed expenses are expenses that do not vary with output (that is, kWh sold), and variable expenses are expenses that vary directly with output. For electric utilities, fixed expenses include the capacity component of purchased power costs, the fixed component of operating and maintenance costs, depreciation and amortization, and taxes. Fuel expenses, including fuel transportation, are the primary variable cost for electric utilities. For utilities with a large wind generation portfolio, the variability in wind production and limited term of the production tax credit also is an additional variable cost.

Q. Do electric utilities experience high operating leverage?

A. Yes. As noted above, operating leverage increases when a firm's commitment to fixed costs rises in relation to its operating margin on sales. The relatively high degree of fixed costs in the electric utility business arises primarily from: (1) the average electric utility's large investment in fixed plant and equipment; and

(2) the relative "fixity" of an electric utility's operating and maintenance costs. High operating leverage causes the average electric utility's operating income to be highly sensitive to demand and revenue fluctuations.

Q. Can an electric utility reduce its operating leverage by purchasing, rather than generating, electricity?

A. No. Electric utilities generally purchase power under long-term contracts that include both a fixed capacity charge and a variable charge that depends on the amount of electricity purchased. Since the fixed capacity charge is designed to recover the seller's fixed costs of generating electricity, electric utilities generally experience the same degree of operating leverage when they purchase power as when they generate power.

Q. How does operating leverage affect a company's business risk?

A. Operating leverage affects a company's business risk through its impact on the variability of the company's profits or income. Generally speaking, the higher a company's operating leverage, the higher is the variability of the company's operating profits.

Q. Does regulation create uncertainty for electric utilities?

A. Yes. Investors' perceptions of the business and financial risks of electric utilities are strongly influenced by their views of the quality of regulation. Investors are painfully aware that regulators in some jurisdictions have been unwilling at times to set rates that allow companies an opportunity to recover their cost of service in a timely manner and earn a fair and reasonable return on investment. As a result of the perceived increase in regulatory risk, investors will demand a higher rate of return for electric utilities operating in those jurisdictions. On the other hand, if

investors perceive that regulators will provide a reasonable opportunity for the company to maintain its financial integrity and earn a fair rate of return on its investment, investors will view regulatory risk as minimal.

Q. You note that financial leverage increases the risk of investing in electric utilities such as MidAmerican. How do economists measure financial leverage?

A. Economists generally measure financial leverage by the percentages of debt and equity in a company's market value capital structure. Companies with a high percentage of debt compared to equity are considered to have high financial leverage.

Q. Why does financial leverage affect the risk of investing in an electric utility's stock?

A. 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, and the presence of higher fixed costs increases the variability of the equity investors' return on investment.

Q. Can the risks facing electric utilities such as MidAmerican be distinguished from the risks of investing in companies in other industries?

A. Yes. The risks of investing in electric utilities such as MidAmerican can be distinguished from the risks of investing in companies in many other industries in several ways. First, the risks of investing in electric utilities are increased because of the greater capital intensity of the electric energy business and the fact that most investments in electric energy facilities are largely irreversible once they are made. Second, unlike returns in competitive industries, the returns from

investment in electric utilities such as MidAmerican are largely asymmetric. That is, there is little opportunity for the utility to earn more than its required return, but a significant chance that the utility will earn less than its required return.

IV. COST OF EQUITY ESTIMATION METHODS

Q. What methods do you use to estimate MidAmerican's cost of equity?

A. I use several generally accepted methods for estimating the cost of equity for MidAmerican. These are the DCF, the ex ante risk premium, the ex post risk premium, and the CAPM. 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 ex ante risk premium method assumes that an investor's expectations regarding the equity risk premium can be estimated from data on the DCF expected rate of return on equity compared to the interest rate on long-term bonds. The ex post risk premium method assumes that an investor's expectations regarding the equity-debt return differential are influenced by the historical record of comparable returns on stock and bond investments. The cost of equity under both risk premium methods is then equal to the expected interest rate on bond investments plus the expected risk premium. The CAPM assumes that the investor's required rate of return on equity is equal to an expected 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 assumption that investors value an asset because they expect to receive a sequence of cash flows 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

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

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. 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, P_s 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 expected dividend yield component of the annual DCF model, and the term g is called the expected growth component of the annual DCF model.

Q. Are you recommending that the annual DCF model be used to estimate MidAmerican's cost of equity?

A. No. The DCF model assumes that a company's stock price is equal to the present discounted value of all expected future dividends. 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 comparable 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, even though the results of the quarterly DCF model for my companies are approximately equal to the results of a properly applied annual DCF model.

Q. Please describe the quarterly DCF model you use.

A. The quarterly DCF model I use is described on Schedule 1 and in 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 do you estimate the quarterly dividend payments in your quarterly DCF model?

A. The quarterly DCF model requires an estimate of the dividends, d_1, d_2, d_3, and d_4, investors expect to receive over the next four quarters. I estimate 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 estimate the next four quarterly dividends with data for a specific company?

A. Yes. In the case of ALLETE, the first company shown in Schedule 1, the last four quarterly dividends are equal to 0.475, 0.49, 0.49, and 0.49; and the growth rate is 6%. Thus dividends, d_1, d_2, d_3, and d_4, are equal to 0.504, 0.519, 0.519, and 0.519 [0.474 x (1 + .06) = 0.504 and [0.51 x (1 + .06) = .5319]. (As noted previously, the logic underlying this procedure is described in Appendix 2.)

Q. How do you estimate the growth component of the quarterly DCF model?

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

Q. What are the analysts' estimates of future EPS growth?

A. As part of their research, financial analysts working at Wall Street firms 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 companies review the forecasts. These estimates represent three to five-year forecasts of EPS growth.

Q. What is I/B/E/S?

A. I/B/E/S is a division of Thomson Reuters 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 do 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 do you rely on analysts' projections of future EPS growth in estimating the investors' expected growth rate rather than looking at past historical growth rates?

A. I rely on analysts' projections of future EPS growth because there is considerable empirical evidence that investors use analysts' forecasts to estimate future earnings growth.

Q. Have you performed any studies concerning the use of analysts' forecasts as an estimate of investors' expected growth rate, g?

A. Yes. I prepared a study with Willard T. Carleton, Professor Emeritus of Finance at the University of Arizona, which 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 and retention growth rates with the average I/B/E/S analysts' forecasts. In every case, the regression equations containing the average of analysts' forecasts statistically outperformed the regression equations containing the historical growth and retention 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 do you use in your DCF model?

A. I use a simple average of the monthly high and low stock prices for each firm for the three-month period ending August 2014. I obtain these high and low stock prices from Thomson Reuters.

Q. Why do you use the three-month average stock price in applying the DCF method?

A. I use 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, to match the stock price with an earnings forecast, it is appropriate to average stock prices over a three-month period.

Q. Do you include an allowance for flotation costs in your DCF analysis?

A. Yes. I include a 5% allowance for flotation costs in my DCF calculations. A complete explanation of the need for flotation costs is contained in Appendix 3.

Q. Please explain your inclusion of flotation costs.

A. All firms that have sold securities in the capital markets have incurred some level of flotation costs, including underwriters' commissions, legal fees, printing expense, etc. These costs are withheld from the proceeds of the stock sale or are paid separately, and must be recovered over the life of the equity issue. Costs vary depending upon the size of the issue, the type of registration method used and other factors, but in general these costs range between 3% and 5% of the proceeds from the issue [see Lee, Inmoo, Scott Lochhead, Jay Ritter, and Quanshui Zhao, "The Costs of Raising Capital," The Journal of Financial Research, Vol. XIX No 1 (Spring 1996), 59-74, and Clifford W. Smith, "Alternative Methods for Raising Capital," Journal of Financial Economics 5 (1977) 273-307]. In addition to these costs, for large equity issues (in relation to outstanding equity shares), there is likely to be a decline in price associated with the sale of shares to the public. On average, the decline due to market pressure has been estimated at 2% to 3% [see Richard H. Pettway, "The Effects of New Equity Sales upon Utility Share Prices," Public Utilities Fortnightly, May 10, 1984, 35—39]. Thus, the total flotation cost, including both issuance expense and market pressure, could range anywhere from 5 to 8% of the proceeds of an equity issue. I believe a combined 5% allowance for flotation costs is a conservative estimate that should be used in applying the DCF model in these proceedings.

Q. How do you apply the DCF approach to estimate the required return on equity for MidAmerican?

A. I apply the DCF approach to the Value Line electric utilities shown in Schedule 1.

Q. How do you select your electric utility company group?

A. I select all the electric utilities followed by Value Line 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) have an I/B/E/S long-term 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 do 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 do 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. Please summarize the results of your application of the DCF model to your company group.

A. As shown on Schedule 1, I obtain an average DCF result of 10.1% for my electric utility group.

B. RISK PREMIUM METHOD

Q. Please describe the risk premium method of estimating the cost of equity.

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

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 to the interest rate 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 as are used to estimate 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 income 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 do you measure the required risk premium on an equity investment in your group of publicly-traded electric utilities?

A. I use two methods to estimate the required risk premium on an equity investment in electric utilities. 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 for measuring the required risk premium on an equity investment in electric utilities.

A. My ex ante risk premium method is based on studies of the DCF expected return on a group of electric utilities compared to the interest rate on 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 perform a regression analysis to determine if there was a relationship between the calculated risk premium and interest rates. Finally, I use the results of the regression analysis to estimate the investors' required risk premium. To estimate the cost of equity, I then add the required risk premium to the forecasted interest rate on A-rated utility bonds. 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 choose to use the yield on A-rated utility bonds because it is a frequently-used benchmark for utility bond yields. A detailed description of my ex ante risk premium studies is contained in Appendix 4, and the underlying DCF results and interest rates are displayed in Schedule 2.

Q. What cost of equity do you obtain from your ex ante risk premium method?

A. 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 forecasted yield to maturity on A-rated utility bonds. I obtain the expected yield to maturity on A-rated utility bonds, 6.25%, by averaging the most recent forecast data from Value Line and the U.S. Energy Information Administration ("EIA").

For my electric utility sample, my analyses produce an estimated risk premium over the yield on A-rated utility bonds equal to 4.74%. Adding an estimated risk premium of 4.74% to the expected 6.25% yield to maturity on A-rated utility bonds produces a cost of equity estimate of 11.0% using the ex ante risk premium method.

Q. How do you obtain the expected yield on A-rated utility bonds?

A. As noted above, I obtain the expected yield to maturity on A-rated utility bonds, 6.25%, by averaging forecast data from Value Line and the EIA. Value Line Selection & Opinion (August 22, 2014) projects a Aaa-rated Corporate bond yield equal to 5.8%. The August 2014 average spread between A-rated utility bonds and Aaa-rated Corporate bonds is five basis points (A-rated utility, 4.13%, less Aaa-rated Corporate, 4.08%, equals five basis points). Adding five basis points to the 5.8% Value Line Aaa Corporate bond forecast equals a forecast yield of 5.85% for the A-rated utility bonds. The EIA in 2014 forecasts a AA-rated utility bond yield equal to 6.58%. The average spread between AA-rated utility and A-rated utility bonds at August 2014 is six basis points (4.13% less 4.07%). Adding six basis points to EIA's 6.58% AA-utility bond yield forecast equals a forecast yield for A-rated utility bonds equal to 6.64%. The average of the forecasts (5.85% using Value Line data and 6.64% using EIA data) is 6.25%.

Q. Why do you use a forecasted yield to maturity on A-rated utility bonds rather than a current yield to maturity?

A. I use a forecasted yield to maturity on A-rated utility bonds rather than a current yield to maturity because the fair rate of return standard requires that a company have an opportunity to earn its required return on its investment during the

forward-looking period during which rates will be in effect. In the case of Wind IX, the cost of the project will not be reflected in rates until the first general rate case after the project is completed.

In addition, because current interest rates are depressed as a result of the Federal Reserve's extraordinary efforts to keep interest rates low in an effort to stimulate the economy, current interest rates at this time are likely a poor indicator of expected future interest rates. Economists project that future interest rates will be higher than current interest rates as the Federal Reserve allows interest rates to rise in order to prevent inflation. Thus, the use of forecasted interest rates is consistent with the fair rate of return standard, whereas the use of current interest rates at this time is not.

2. Ex Post Risk Premium Method

Q. Please describe your ex post risk premium method for measuring the required risk premium on an equity investment in electric utilities.

A. I first perform a study of the comparable returns received by bond and stock investors over the 77 years of my study. I estimate 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 consists 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 return each year to 2014. The return associated with each stock portfolio is the sum of the annual dividend yield and capital gain (or loss) which 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) which 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 between 1937 and 2014 are shown on Schedule 3. The average annual return on an investment in the S&P 500 stock portfolio is 11.3%, while the average annual return on an investment in the Moody's A-rated utility bond portfolio is 6.6%. The risk premium on the S&P 500 stock portfolio is, therefore, 4.7%.

I also conduct a second study using stock data on the S&P Utilities rather than the S&P 500. As shown on Schedule 4, the average annual return the S&P Utility stock portfolio is 10.5% per year. Thus, the return on the S&P Utility stock portfolio exceeds the return on the Moody's A-rated utility bond portfolio by 3.9%.

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 perform my ex post risk premium analysis on both the S&P 500 and the S&P Utilities 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 to 2014. Thus, I use the average of the two historically-based risk premiums as my estimate of the required risk premium for MidAmerican in my ex post risk premium method.

Q. Would your study provide a different risk premium if you started with a different time period?

A. Yes. The risk premium results vary somewhat depending on the historical time period chosen. My policy is 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. Because 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 has not materially impacted the structure of the public utility industry; thus, the Act's repeal does not have any impact on my choice of time period.)

Q. Why is it necessary 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 expected bond yields because the return on equity, as a residual return, is less certain than the yield on bonds; and investors must be compensated for this uncertainty. Investors' expectations concerning the amount by which the return on equity will exceed the bond yield may be influenced by historical differences in returns to bond and stock investors. Thus, we can estimate investors' expected returns from an equity investment from information about past differences between returns on stocks and bonds. In interpreting this information, investors would also recognize that risk premiums increase when interest rates are low.

Q. What conclusions do you draw from your ex post risk premium analyses about the required return on an equity investment in electric utilities?

A. My studies provide evidence that investors today require an equity return of approximately 3.9 to 4.7 percentage points above the expected yield on A-rated

utility bonds. As discussed above, the expected yield on A-rated utility bonds is 6.25%. Adding a 3.9 to 4.7 percentage point risk premium to a yield of 6.25% on A-rated utility bonds, I obtain an expected return on equity in the range 10.1% to 10.9%, with a midpoint estimate equal to 10.5%. Adding a 21 basis point allowance for flotation costs, I obtain an estimate of 10.8% as the ex post risk premium cost of equity. (I determine the flotation cost allowance by calculating the difference in my DCF results with and without a flotation cost allowance.)

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 do 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 use a forecasted yield to maturity on 20-year Treasury bonds of 4.85%, obtained using data from Value Line and EIA. For my estimate of the

company-specific risk, or beta, I use the average 0.75 Value Line beta for my group of electric utilities. For my estimate of the expected risk premium on the market portfolio, I use two approaches. First, I estimate the risk premium on the market portfolio using historical risk premium data reported by Ibbotson® SBBI®. Second, I estimate the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500 and the forecasted yield to maturity on 20-year Treasury bonds.

Q. How do you obtain the forecasted yield to maturity on 20-year Treasury bonds?

A. As noted above, I use data from Value Line and EIA to obtain a forecasted yield to maturity on 20-year Treasury bonds. Value Line forecasts a yield on 10-year Treasury notes equal to 4.5%. The current spread between the average August 2014 yield on 10-year Treasury notes (2.42%) and 20-year Treasury bonds (2.94%) is 52 basis points. Adding 52 basis points to Value Line's 4.5% forecasted yield on 10-year Treasury notes produces a forecasted yield of 5.02% for 20-year Treasury bonds (see Value Line Investment Survey, Selection & Opinion, August 22, 2014). EIA forecasts a yield of 4.16% on 10-year Treasury notes. Adding the 52 basis point spread between 10-year Treasury notes and 20-year Treasury bonds to the EIA forecast of 4.16% for 10-year Treasury notes produces an EIA forecast for 20-year Treasury bonds equal to 4.68%. The average of the forecasts is 4.85% (5.02% using Value Line data and 4.68% using EIA data).

1. Historical CAPM

Q. How do you estimate the expected risk premium on the market portfolio using historical risk premium data reported by Ibbotson® SBBI®?

A. I estimate the expected risk premium on the market portfolio by calculating the difference between the arithmetic mean total return on the S&P 500 from 1926 to 2014 (12.05%) and the average income return on 20-year U.S. Treasury bonds over the same period (5.08%). Thus, my historical risk premium method produces a risk premium of 7.0% (12.05 – 5.08 = 7.0).

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 Ibbotson® SBBI®2013 Valuation Yearbook, 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. [Ibbotson® SBBI® at 56.]

A discussion of the importance of using arithmetic mean returns in the context of CAPM or risk premium studies is contained in Schedule 5.

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 risk free, but the total return, which includes both 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 do you obtain when you estimate the expected risk premium on the market portfolio from the arithmetic mean difference between the return on the market and the yield on 20-year Treasury bonds?

A. Using a risk-free rate equal to 4.85%, an electric utility beta equal to 0.75, a risk premium on the market portfolio equal to 7%, and a flotation cost allowance equal to 21 basis points, I obtain an historical CAPM estimate of the cost of equity equal to 10.5% for my electric utility group (4.85 + 0.75 x 7 + 0.21 = 10.3) (see Schedule 6).

Q. Is there any evidence from the finance literature that the application of the historical CAPM may underestimate the cost of equity?

A. Yes. There is substantial evidence that: (1) the historical CAPM tends to underestimate the cost of equity for companies whose equity beta is less than 1.0; and (2) the CAPM is less reliable the further the estimated beta is from 1.0.

Q. What is the evidence that the CAPM tends to underestimate the cost of equity for companies with betas less than 1.0 and is less reliable the further the estimated beta is from 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 is less reliable the further the estimated beta is from 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 (1979), Banz (1981), Fama and French (1992), Fama and French (2004), Fama and MacBeth (1973), and Jegadeesh and Titman (1993).[1]

Q. Can you briefly summarize these articles?

A. Yes. The CAPM conjectures that security returns increase with increases in security betas in line with the equation:

$$ER_i = R_f + \beta_i \left[ER_m - R_f \right],$$

where ERi is the expected return on security or portfolio i, Rf is the risk-free rate, ERm – Rf is the expected risk premium on the market portfolio, and βi is a measure of the risk of investing in security or portfolio i (see Figure 1 below).

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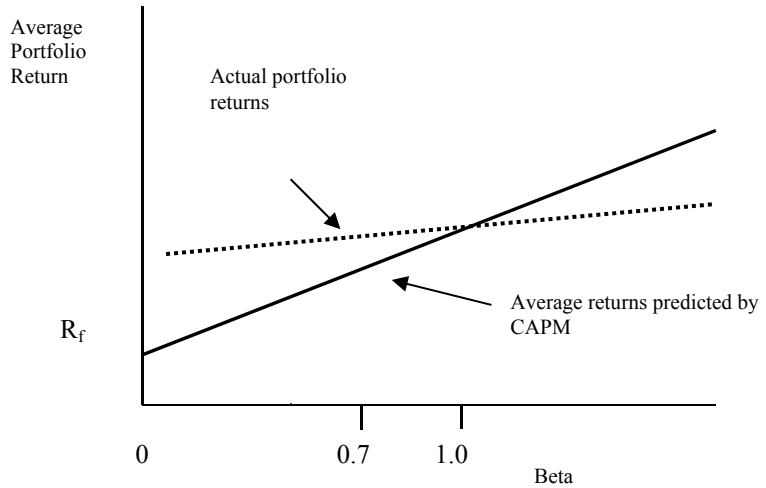
1 Fischer Black, Michael C. Jensen, and Myron Scholes, "The Capital Asset Pricing Model: Some Empirical Tests," in *Studies in the Theory of Capital Markets*, M. Jensen, ed. New York: Praeger, 1972; Eugene Fama and James MacBeth, "Risk, Return, and Equilibrium: Empirical Tests," *Journal of Political 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; Eugene F. Fama and Kenneth R. French, "The Cross-Section of Expected Returns," *Journal of Finance* (June 1992), 47:2, pp. 427-465; Eugene F. Fama and Kenneth R. French, "The Capital Asset Pricing Model: Theory and Evidence," *The Journal of Economic Perspectives* (Summer 2004), 18:3, pp. 25 – 46; Narasimhan Jegadeesh and Sheridan Titman, "Returns to Buying Winners and Selling Losers: Implications for Stock Market Efficiency," *The Journal of Finance*, Vol. 48, No. 1. (Mar., 1993), pp. 65-91.

FIGURE 1
AVERAGE RETURNS COMPARED TO BETA
FOR PORTFOLIOS FORMED ON PRIOR BETA



Financial scholars have studied the relationship between estimated portfolio betas and the achieved returns on the underlying portfolio of securities to test whether the CAPM correctly predicts achieved returns in the marketplace. They find that the relationship between returns and betas is inconsistent with the relationship posited by the CAPM. As described in Fama and French (1992) and Fama and French (2004), the actual relationship between portfolio betas and returns is shown by the dotted line in Figure 1 above. Although financial scholars disagree on the reasons why the return/beta relationship looks more like the dotted line in Figure 2 than the straight line, they generally agree that the dotted line lies above the straight line for portfolios with betas less than 1.0 and below the straight line for portfolios with betas greater than 1.0. Thus, in practice, scholars generally agree that the CAPM underestimates portfolio returns for companies with betas less than 1.0, and overestimates portfolio returns for portfolios with betas greater than 1.0.

Q. Do you have additional evidence that the CAPM tends to underestimate the cost of equity for utilities with average betas less than 1.0?

A. Yes. As shown in Schedule 7, over the period 1937 to 2014, investors in the S&P Utilities Stock Index have earned a risk premium over the yield on long-term Treasury bonds equal to 5.21%, while investors in the S&P 500 have earned a risk premium over the yield on long-term Treasury bonds equal to 6.00%. According to the CAPM, investors in utility stocks should expect to earn a risk premium over the yield on long-term Treasury securities equal to the average utility beta times the expected risk premium on the S&P 500. Thus, the ratio of the risk premium on the utility portfolio to the risk premium on the S&P 500 should equal the utility beta. However, the average utility beta at the time of my studies is approximately 0.75, whereas the historical ratio of the utility risk premium to the S&P 500 risk premium is 0.87 (5.21 ÷ 6.00 = 0.87). In short, the current 0.75 measured beta for electric utilities underestimates the cost of equity for electric utilities, providing further support for the conclusion that the CAPM underestimates the cost of equity for electric utilities at this time.

Q. Can you adjust for the tendency of the CAPM to underestimate the cost of equity for companies with betas significantly less than 1.0?

A. Yes. I can implement the CAPM using the 0.87 beta I discuss above, which I obtain by comparing the historical returns on utilities to historical returns on the S&P 500.

Q. What CAPM result do you obtain when you use a beta equal to 0.87 rather than an electric utility beta equal to 0.75?

A. I obtain a CAPM result equal to 11.2% using a risk free rate equal to 4.85%, a beta equal to 0.87, the historical market risk premium equal to 7.0%, and a flotation cost allowance of 21 basis points (4.85 + 0.87 x 7.0+ 0.21= 11.2). (See Schedule 8.)

2. DCF-Based CAPM

Q. How does your DCF-Based CAPM differ from your historical CAPM?

A. As noted above, my DCF-based CAPM differs from my historical CAPM only in the method I use to estimate the risk premium on the market portfolio. In the historical CAPM, I use historical risk premium data to estimate the risk premium on the market portfolio. In the DCF-based CAPM, I estimate the risk premium on the market portfolio from the difference between the DCF cost of equity for the S&P 500 and the forecasted yield to maturity on 20-year Treasury bonds.

Q. What risk premium do you obtain when you calculate the difference between the DCF-return on the S&P 500 and the risk-free rate?

A. Using this method, I obtain a risk premium on the market portfolio equal to 7.4% (see Schedule 9).

Q. What CAPM result do you obtain when you estimate the expected return on the market portfolio by applying the DCF model to the S&P 500?

A. Using a risk-free rate of 4.85%, an electric utility beta of 0.75, a risk premium on the market portfolio of 7.4%, and a flotation cost allowance of 21 basis points, I obtain a CAPM result of 10.6% for my electric utility group. Using a risk-free rate of 4.85%, an electric utility beta of 0.87, a risk premium on the market portfolio

of 7.4%, and a flotation cost allowance of 21 basis points, I obtain a CAPM result of 11.5% for my electric utility group.

V. CONCLUSION REGARDING MIDAMERICAN'S COST OF EQUITY

Q. Based on your application of several cost of equity methods to your proxy company groups, what is your conclusion regarding MidAmerican's cost of equity?

A. Based on my application of several cost of equity methods, I conclude that MidAmerican's cost of equity is in the range 10.1% to 11.0%, with an average equal to 10.6% (see TABLE 1). I conclude that the cost of equity for MidAmerican is 10.6%.

TABLE 1
COST OF EQUITY MODEL RESULTS

MODEL	ELECTRIC UTILITIES
Discounted Cash Flow	10.1%
Ex Ante Risk Premium	11.0%
Ex Post Risk Premium	10.8%
CAPM – Historical	10.3%
CAPM - DCF Based	10.6%
Average	10.6%

VI. THE FAIR RETURN ON EQUITY FOR WIND IX

Q. How do you assess whether MidAmerican's requested 11.75% return on equity for Wind IX is fair and reasonable?

A. As discussed above, I estimate the reasonableness of MidAmerican's requested 11.75% return on equity for its investment in Wind IX in two steps. First, I estimate MidAmerican's cost of equity by applying standard cost of equity methods to proxy groups of comparable utilities. Second, I assess an appropriate

differential for the fixed 30-year return on MidAmerican's proposed investment in a clean energy project that satisfies the goals and intent of Iowa Code § 476.53.

Q. How do you determine an appropriate return that satisfies the goals and intent of Iowa Code § 476.53?

A. I determine an appropriate return by comparing the allowed returns on equity in MidAmerican's previous advance ratemaking decisions to the average allowed returns on equity for electric utilities in the same year as the decisions. I believe that the average difference between the allowed returns in advance ratemaking decisions and the allowed return on equity in electric utility rate cases may provide a benchmark for determining an appropriate return differential for MidAmerican's Wind IX investment.

Q. What is the average difference between the allowed returns on equity in MidAmerican's previous advance ratemaking decisions and the allowed returns on equity in state electric utility rate cases?

A. The average difference in MidAmerican's previous advance ratemaking cases compared to the allowed return on equity in state utility rate cases is 141 basis points (see **TABLE 2**). Because the difference between MidAmerican's requested 11.75% return on equity and my 10.6% estimate of MidAmerican's cost of equity (115 basis points) is less than the average differential in MidAmerican's previous advance ratemaking cases (141 basis points), I conclude that MidAmerican's requested 11.75% return on equity is fair and reasonable.

TABLE 2
AVERAGE ALLOWED RETURN DIFFERENTIAL
MIDAMERICAN IOWA RATEMAKING DOCKETS
COMPARED TO AVERAGE ALLOWED ELECTRIC UTILITY RETURNS
IN STATE RATE CASES[2]

LINE	YEAR	AVERAGE ALLOWED ROE ELECTRIC RATE CASES	ADVANCE RATEMAKING ROE	INCENTIVE PREMIUM
1	2002	11.16%	12.23%	1.07%
2	2003	10.97%	12.29%	1.32%
3	2003	10.97%	12.20%	1.23%
4	2005	10.54%	12.20%	1.66%
5	2006	10.36%	11.90%	1.54%
6	2007	10.36%	11.70%	1.34%
7	2008	10.46%	11.70%	1.24%
8	2009	10.48%	12.20%	1.72%
9	2013	10.02%	11.63%	1.61%
10	Average	10.59%	12.01%	1.41%

Q. Have you examined any other evidence to test the reasonableness of MidAmerican's requested 11.75% return on equity?

A. Yes. I have compared the allowed rates of return for MidAmerican's previous advance ratemaking applications to the average yield on Moody's A-rated utility bonds in the 12 months prior to the date of the order. I find that the average premium over the average yield on A-rated utility bonds in MidAmerican's previous applications is 5.8%. (See Schedule 10.) Adding this 5.8% premium to the 6.25% forecasted yield on A-rated utility bonds produces a return on equity equal to 12.0%. Because MidAmerican is requesting a rate of return on equity equal to 11.75%, this information provides additional evidence that MidAmerican's requested return is fair and reasonable.

[2] Data from Regulatory Research Associates Regulatory Focus, "Major Rate Case Decisions – Calendar 2013," January 15, 2014.

Q. Does this conclude your pre-filed direct testimony?

A. Yes, it does.

STATE OF NORTH CAROLINA)
) ss:
COUNTY OF DURHAM)

I, James H. Vander Weide, being first duly sworn, depose and state that the statements contained in the foregoing prepared direct testimony are true and correct to the best of my knowledge, information and belief, and that such prepared direct testimony constitutes my sworn statement in this proceeding.

/s/ James H. Vander Weide

Subscribed and sworn to before me this 6th day of October, 2014.

/s/ Tochukwu Chime Ukpabi
Notary Public – North Carolina

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Schedule 1	Summary of Discounted Cash Flow Analysis for Electric Utilities
Schedule 2	Comparison of the DCF Expected Return on an Investment in Electric Utilities to the Interest Rate on Moody's A-Rated Utility Bonds
Schedule 3	Comparative Returns on S&P 500 Stock Index and Moody's A-Rated Bonds 1937—2013
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Appendix 3	Adjusting for Flotation Costs in Determining a Public Utility's Allowed Rate of Return on Equity
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