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*OCC EXHIBIT* ____

**BEFORE**
**THE PUBLIC UTILITIES COMMISSION OF OHIO**

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| In the Matter of the Application of The Dayton Power and Light Company for Approval of Its Electric Security Plan. | ) ) ) | Case No. 08-1094-EL-SSO |
| In the Matter of the Application of The Dayton Power and Light Company for Approval of Revised Tariffs. | ) ) ) | Case No. 08-1095-EL-ATA |
| In the Matter of the Application of The Dayton Power and Light Company for Approval of Certain Accounting Authority Pursuant to Ohio Rev. Code §4905.13. | ) ) ) ) ) | Case No. 08-1096-EL-AAM |
| In the Matter of the Application of The Dayton Power and Light Company for Approval of Its Amended Corporate Separation Plan. | ) ) ) ) | Case No. 08-1097-EL-UNC |



# DIRECT TESTIMONY
of
**J. RANDALL WOOLRIDGE, Ph.D**

**ON BEHALF OF**
**THE OFFICE OF THE OHIO CONSUMERS' COUNSEL**
*10 West Broad Street, 18th Floor*
*Columbus, Ohio 43215-3485*

***January 26, 2009***

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## EXHIBITS

***Q1. PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.***

*A1.* My name is J. Randall Woolridge, and my business address is 120 Haymaker Circle, State College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration at the University Park Campus of the Pennsylvania State University. I am also the Director of the Smeal College Trading Room and President of the Nittany Lion Fund, LLC. A summary of my educational background, research, and related business experience is provided in Appendix A.

## I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

***Q2. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?***

*A2.* I have been asked by the Ohio Office of Consumer's Counsel ("OCC") to provide an opinion as to the overall fair rate of return or cost of capital for the Dayton Power & Light Company ("Dayton" or "Company"), to evaluate Dayton's rate of return testimony in this proceeding, and to provide an opinion as to the appropriate rate for the calculation of carrying costs.

***Q3. HOW IS YOUR TESTIMONY ORGANIZED?***

*A3.* First I will review my cost of capital recommendation for Dayton, and review the primary areas of contention between Dayton's rate of return position and OCC.

Second, I provide an assessment of capital costs in today's capital markets. Third, I discuss my proxy group of electric utility companies for estimating the cost of capital for Dayton. Fourth, I present my recommendations for the Company's capital structure and debt cost rate. Fifth, I discuss the concept of the cost of equity capital, and then estimate the equity cost rate for Dayton. Sixth, I critique Dayton's rate of return analysis and testimony. Next, I present a financial analysis of Dayton's performance over the past five years. Finally, I present my recommendation for the appropriate rate for the calculation of carrying costs. I have a table of contents just after the title page for a more detailed outline.

***Q4. PLEASE REVIEW YOUR RECOMMENDATIONS REGARDING THE APPROPRIATE RATE OF RETURN FOR DAYTON.***

*A4.* I have used the capital structure and senior capital cost rates of Dayton's parent, DPL Inc., in my recommendation. This is the capitalization that Dayton ultimately relies upon to raise capital and it also more accurately reflects the capitalizations of electric utilities. I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to a proxy group of publicly-held electric utility companies ("Electric Proxy Group"). My analysis indicates an equity cost rate in the range of 7.1%-10.0% for Dayton. I have used an equity cost rate at the upper end of the range, 9.75%, in recognition of the current volatile capital market conditions. However, I reserve the right to update my equity cost rate recommendations prior to hearings. This is because, in my opinion, the current market conditions are in disequilibrium as investors attempt

to sort out the economic consequences of the collapse of the financial sector and the unprecedented bail out by the U. S. government. In addition, certain financial data have not been updated to reflect the current economic situation. Using my capital structure and debt and equity cost rates, I am recommending an overall rate of return of 7.47% for the distribution and generation operations of Dayton. These findings are summarized in Exhibit JRW-1.

***Q5. PLEASE SUMMARIZE THE PRIMARY ISSUES REGARDING RATE OF RETURN IN THIS PROCEEDING.***

*A5.* Dr. Jeffrey Makholm provides the Company's proposed capital structure and debt and equity cost rates. My analysis suggests that the Company's recommended capital structure with a common equity ratio of 64.7% is extremely equity-rich when compared to the capitalizations of electric utility companies and to past common equity ratios of Dayton. I have therefore used DPL Inc.'s capital structure which is Dayton's primary source of capital and is more reflective of the capital structures of electric utilities. I have used DPL Inc's. debt and preferred stock cost rates.

As for the equity cost rate, Dr. Makholm's estimate is 11.3%, whereas my analysis indicates an equity cost rate of 9.75% is appropriate for Dayton. We have both used DCF and CAPM approaches to estimating an equity cost rate for the Company. Dr. Makholm has applied these approaches to a proxy group of electric and gas companies. I have also used a proxy group, but it consists of only

electric utility companies. It is my contention that my electric utility proxy group is the appropriate comparable group for Dayton.

In terms of the DCF approach, the two major areas of disagreement are (1) the appropriate adjustment to the DCF dividend yield, and (2) most significantly, the estimation of the expected growth rate. With respect to (1), Dr. Makholm has made several inappropriate adjustments to the spot dividend yield. With respect to (2), Dr. Makholm has relied exclusively on the forecasted earnings per share ("EPS") growth rates of Wall Street analysts and *Value Line* in estimating a DCF equity cost rate. I have used both historic and projected growth rate measures, and have evaluated growth in dividends, book value, and earnings per share. A very significant factor that I consider and highlight is the upwardly-biased expected earnings growth rates of Wall Street analysts and *Value Line.*

The CAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. Whereas there is general agreement on the beta and risk-free interest rate, we have significantly different views on the alternative approaches to measuring the equity risk premium as well as the magnitude of equity risk premium. As I highlight in my testimony, there are three procedures for estimating an equity risk premium – historic returns, surveys, and expected return models. Dr. Makholm uses (1) top-down equity risk premium of 9.49% which he develops by applying the DCF model to the S&P 500, and (2) a historical risk premium of 6.42% using the Ibbotson results. I demonstrate that

Dr. Makholm's projected top-down equity risk premium, which uses analysts' EPS growth rate projections, includes unrealistic assumptions regarding future economic and earnings growth and stock returns. In addition, I provide evidence that risk premiums based on historic stock and bond returns are subject to a myriad of empirical errors which results in upwardly biased measures of expected equity risk premiums. In contrast, I have used an equity risk premium of 4.77% which (1) uses all three approaches to estimating an equity premium and (2) employs the results of many studies of the equity risk premium. As I note, my equity risk premium is consistent with the equity risk premiums (1) discovered in recent academic studies by leading finance scholars, (2) employed by leading investment banks and management consulting firms, and (3) found in surveys of financial forecasters and corporate CFOs.

Dr. Makholm also includes a flotation cost adjustment in computing his DCF and CAPM equity cost rates. I argue that such an adjustment is not needed in this proceeding.

In the end, the most significant areas of disagreement between Dr. Makholm and me with respect to the cost of equity are (1) the sole use of the upwardly biased EPS growth rate projections of Wall Street analysts and *Value Line* in the DCF model, and (2) the measurement and magnitude of the equity risk premium.

## II. CAPITAL COSTS IN TODAY'S MARKETS

***Q6. PLEASE DISCUSS CAPITAL COSTS IN TODAY'S MARKETS.***

*A6.* Long-term capital cost rates for U.S. corporations are at their lowest levels in more than four decades. Corporate capital cost rates are determined by the level of interest rates and the risk premium demanded by investors to buy the debt and equity capital of corporate issuers. The base level of long-term interest rates in the U.S. economy is indicated by the rates on ten-year U.S. Treasury bonds. The rates are provided in Exhibit JRW-2 from 1953 to the present. As indicated, prior to the decline in rates that began in the year 2000, the 10-year Treasury yield had not consistently been in the 4-5 percent range over an extended period of time since the 1960s.

The second base component of the corporate capital cost rates is the risk premium. The risk premium is the return premium required by investors to purchase riskier securities. The equity risk premium is the return premium required to purchase stocks as opposed to bonds. Since the equity risk premium is not readily observable in the markets (as are bond risk premiums), and there are alternative approaches to estimating the equity premium, it is the subject of much debate. One way to estimate the equity risk premium is to compare the mean returns on bonds and stocks over long historical periods. Measured in this manner, the equity risk premium has been in the 5-7 percent range. But recent studies by leading academics indicate the forward-looking equity risk premium is

in the 3-4 percent range. These authors indicate that historical equity risk premiums are upwardly biased measures of expected equity risk premiums. Jeremy Siegel, a Wharton finance professor and author of the book *Stocks for the Long Term*, published a study entitled "The Shrinking Equity Risk Premium."[1] He concludes:

> The degree of the equity risk premium calculated from data estimated from 1926 is unlikely to persist in the future. The real return on fixed-income assets is likely to be significantly higher than estimated on earlier data. This is confirmed by the yields available on Treasury index-linked securities, which currently exceed 4%. Furthermore, despite the acceleration in earnings growth, the return on equities is likely to fall from its historical level due to the very high level of equity prices relative to fundamentals.

In sum, the relatively low interest rates in today's markets as well as the lower risk premiums required by investors indicate that capital costs for U.S. companies are the lowest in decades.

***Q7. PLEASE DISCUSS THE IMPACT OF RECENT CAPITAL MARKET VOLATILITY CONDITIONS ON THE EQUITY RISK PREMIUM AND THE EQUITY COST RATE.***

*A7.* The mortgage, subprime, and credit crises on Wall Street have led to increased

[1] Jeremy J. Siegel, "The Shrinking Equity Risk Premium," *The Journal of Portfolio Management* (Fall 1999) p. 15.

market volatility and the unprecedented actions by the U.S. government to resolve the financial crisis. To assess the impact of recent capital market volatility on the equity risk premium and the equity cost rate, one must look at the volatility of stocks relative to bonds. I have performed such an analysis on page 1 of Exhibit JRW-3. To compare the volatility of stocks and bonds, one must standardize the volatility measure. This is normally done by dividing the volatility measure, the standard deviation, by the mean. This standardized volatility measure is known as the Coefficient of Variation ("CV").

***Q8. GIVEN THESE OBSERVATIONS, PLEASE PROVIDE YOUR ASSESSMENT OF THE IMPACT OF RECENT CAPITAL MARKET CONDITIONS ON THE EQUITY COST RATE.***

*A8.* I have performed an analysis of the volatility of stocks relative to bonds since 1997. I have used the S&P 500 and the Bear Stearns Bond Price Index ("BSBPI") and computed the CV using a twenty-two day mean and standard deviation. A twenty two day period approximates one month of trading. In Panel A of Exhibit JRW-3, page 1, I have graphed the CV for the S&P 500 and the BSBPI since the year 2000. In association with the unprecedented economic events in the third quarter of 2008, there is a dramatic increase in the volatility of stocks and a not so dramatic increase in the volatility of bonds. However, since the September – October 2008 time frame, stock volatility has declined significantly while bond volatility has remained relatively high. This is evident in Panel B, in which I have graphed the ratio of the CV(Stock CV)/CV(Bond CV). Hence, this graph shows

the standardized volatility of stocks relative to bonds. Higher levels of this ratio represent time periods when stock volatility is high relative to bond volatility, and low levels of this ratio occur during time periods when stock volatility is low relative to bonds. It demonstrates that whereas stock volatility was high relative to bond volatility in the third quarter of 2008, the relative volatility of stocks to bonds has decreased significantly in recent months. This simply reflects the fact that stock volatility has declined but bond volatility has remained high. As such, the volatility of stocks relative to bonds has declined, suggesting that the markets have settled somewhat compared to the third quarter of 2008.

***Q9. HOW HAVE THE BONDS AND STOCKS OF ELECTRIC UTILITY COMPANIES FARED IN THE CURRENT MARKET COMPARED TO STOCKS IN GENERAL?***

*A9.* Pages 2 and 3 of Exhibit JRW-3 contain a recent article from the *Wall Street Journal* which highlights the fact that the market for the bonds of utilities has come back significantly in the last two months. In particular, the article highlights the fact that utility bonds are viewed as a 'safe haven' in the current market and that, over the past month, yields on utility bonds have declined significantly and utility bond issuances have picked up. The article also notes that utilities are likely to benefit under an Obama administration and includes a quote from the CFO of Progress Energy, who says:

"People have turned the page on 2008 and spreads have come down for people like us," said Mark Mulhern, Progress Energy's chief financial officer.

To evaluate how electric utility stocks have fared relative to the overall market, I have compared the performance of electric utility stocks relative to the S&P 500 over the past six months. For the electric utility stocks, I have used the thirteen companies in my Electric Proxy Group (which is discussed below). I have compared the average stock price performance of this group relative to the price performance of the S&P 500 from July 1, 2008 until January 1, 2009. The results are provided in the graph below. Over the six months, the S&P 500 has declined to 73.4% of its July 1, 2008 value, which represents a loss of 26.6%. On the other hand, electric utility stocks have only decreased to 96.9% of their July 1, 2008 values. This represents a loss of only 3.1%. Moreover, during this time period, the S&P 500 was over 2.5 times as risky as the electric utility stocks as measured by the coefficient of variation. As such, this evidence suggests that electric utility stocks have held up extremely well in the current market conditions compared to the overall market.

## III. PROXY GROUP SELECTION

***Q10. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR DAYTON.***

*A10.* To develop a fair rate of return recommendation for Dayton, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held electric utility companies.

***Q11. PLEASE DESCRIBE YOUR PROXY GROUP OF ELECTRIC UTILITY COMPANIES.***

*A11.* My Electric Proxy Group consists of thirteen electric utility companies. These companies met the following selection criteria: (1) listed as an Electric Utility in *AUS Utility Reports*; (2) listed as an Electric Utility in the Standard Edition of the *Value Line Investment Survey*; (3) at least 75% regulated electric revenues; (4) operating revenues of less than $10B; and (5) an investment grade bond rating by Moody's and Standard & Poor's. Summary financial statistics for the Electric Proxy Group are listed in Exhibit JRW-4. The average operating revenues and net plant for the group are $2,907.8M and $5,292.0M, respectively. On average, the group receives 91% of revenues from regulated electric operations, has a 'Baa1' Moody's bond rating, a current common equity ratio of 45%, and an earned return on common equity of 8.6%.

## IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

***Q12. WHAT IS THE RECOMMENDED CAPITAL STRUCTURE OF THE COMPANY?***

*A12.* The Company's recommended capital structure is shown in Panel A of page 1 of Exhibit JRW-5. The Company is requesting a capital structure consisting of 34.35% debt, 0.94% preferred stock, and 64.71% common equity. This is a hypothetical capital structure.

***Q13. IS THE COMPANY'S RECOMMENDED CAPITAL STRUCTURE APPROPRIATE FOR DAYTON?***

*A13.* No. This capital structure is not appropriate for Dayton. First, the proposed capital structure ratios do not reflect the actual capitalization of Dayton. Panel B of page 1 of Exhibit JRW-5 shows the average capital structure ratios for the Company over the past three years. The average common equity ratio over this time period is 60.19%. Second, the proposed capital structure ratios do not reflect the capitalization of electric utility companies. Panel C of page 1 of Exhibit JRW-5 shows the average common equity ratio for the Electric Proxy Group in 2008. The average common equity for 2008 for the group, including short-term debt, is 45.7%. Panel D of page 1 of Exhibit JRW-5 provides the average capital structure ratios of the Electric Proxy Group over the most recent four quarters. These ratios include only long-term capital and therefore exclude short-term debt. Panel E provides the average over the past four quarters. These figures include 52.13% long-debt, 0.49% preferred stock, and a 47.38% common equity. This demonstrates that the proposed capital structure for Dayton is significantly out of line with the capital structures of electric utility companies.

***Q14. WHAT CAPITAL STRUCTURE ARE YOU EMPLOYING FOR DAYTON?***

*A14.* I will use the capital structure ratios for Dayton's parent, DPL Inc., in developing my cost of capital. This is the capitalization that Dayton ultimately relies upon to raise capital and it also more accurately reflects the capitalizations of electric utilities. Panel F of page 1 of Exhibit JRW-5 provides DPL Inc.'s capital structure as of 9/30/08 and it consists of 57.50% long-debt, 1.03% preferred stock, and a 41.47% common equity. DPL, Inc. has been increasing its common equity ratio is recent years, and is projected to continue this strategy over the next year. As shown in Panel G of page 1 of Exhibit JRW-5, *Value Line* forecasts a 2009 capitalization for DPL consisting of 54.0% long-debt, 0.50% preferred stock, and a 45.5% common equity. I will use these capital structure ratios for Dayton.

***Q15. WHAT DEBT AND PREFERRED STOCK COST RATES ARE YOU USING IN YOUR COST OF CAPITAL CALCULATION FOR DAYTON?***

*A15.* I have computed DPL's long-term debt and preferred stock cost rates on page 4 of Exhibit JRW-5 using data from *Value Line.* These cost rates are 5.59% and 3.93%, respectively.

## V. THE COST OF COMMON EQUITY CAPITAL

### A. Overview

***Q16. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?***

*A16.* In a competitive industry, the return on a firm's common equity capital is determined through the competitive market for its goods and services. Due to the capital requirements needed to provide utility services, however, and to the economic benefit to society from avoiding duplication of these services, some public utilities are monopolies. It is not appropriate to permit monopoly utilities to set their own prices because of the lack of competition and the essential nature of the services. Thus, regulation seeks to establish prices that are fair to consumers and at the same time are sufficient to meet the operating and capital costs of the utility (i.e., provide an adequate return on capital to attract investors).

***Q17. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE CONTEXT OF THE THEORY OF THE FIRM.***

*A17.* The total cost of operating a business includes the cost of capital. The cost of common equity capital is the expected return on a firm's common stock that the marginal investor would deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected and required rates of return on a company's common stock are equal.

Normative economic models of the firm, developed under very restrictive assumptions, provide insight into the relationship between firm performance or profitability, capital costs, and the value of the firm. Under the economist's ideal

model of perfect competition where entry and exit are costless, products are undifferentiated, and there are increasing marginal costs of production, firms produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is established where price equals average cost, including the firm's capital costs. In equilibrium, total revenues equal total costs, and because capital costs represent investors' required return on the firm's capital, actual returns equal required returns and the market value and the book value of the firm's securities must be equal.

In the real world, firms can achieve competitive advantage due to product market imperfections. Most notably, companies can gain competitive advantage through product differentiation (adding real or perceived value to products) and by achieving economies of scale (decreasing marginal costs of production). Competitive advantage allows firms to price products above average cost and thereby earn accounting profits greater than those required to cover capital costs. When these profits are in excess of that required by investors, or when a firm earns a return on equity in excess of its cost of equity, investors respond by valuing the firm's equity in excess of its book value.

James M. McTaggart, founder of the international management consulting firm Marakon Associates, has described this essential relationship between the return

on equity, the cost of equity, and the market-to-book ratio in the following manner:[2]

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.

A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

[2] James M. McTaggart, "The Ultimate Poison Pill: Closing the Value Gap," *Commentary* (Spring 1988), p. 2.

As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm that earns a return on equity above its cost of equity will see its common stock sell at a price above its book value. Conversely, a firm that earns a return on equity below its cost of equity will see its common stock sell at a price below its book value.

***Q18. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP BETWEEN RETURN ON EQUITY AND MARKET-TO-BOOK RATIOS.***

*A18.* This relationship is discussed in a classic Harvard Business School case study entitled "A Note on Value Drivers." On page 2 of that case study, the author describes the relationship very succinctly:[3]

> For a given industry, more profitable firms – those able to generate higher returns per dollar of equity – should have higher market-to-book ratios. Conversely, firms which are unable to generate returns in excess of their cost of equity should sell for less than book value.

| *Profitability* | *Value* |
|---|---|
| *If ROE > K* | *then Market/Book > 1* |
| *If ROE = K* | *then Market/Book =1* |
| *If ROE < K* | *then Market/Book < 1* |

To assess the relationship by industry, as suggested above, I have performed a regression study between estimated return on equity and market-to-book ratios

[3] Benjamin Esty, "A Note on Value Drivers," Harvard Business School, Case No. 9-297-082, April 7, 1997.

using natural gas distribution, electric utility and water utility companies. I used all companies in these three industries which are covered by *Value Line* and who have estimated return on equity and market-to-book ratio data. The results are presented in Panels A-C of Exhibit JRW-6. The average R-squares for the electric, gas, and water companies are 0.65, 0.60, and 0.92.[4] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities. This means that utilities with higher expected ROEs sell at higher market-to-book ratios.

***Q19. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY CAPITAL FOR PUBLIC UTILITIES?***

*A19.* Exhibit JRW-7 provides indicators of public utility equity cost rates over the past decade. Page 1 shows the yields on 10-year 'A' rated public utility bonds. These yields peaked in the 1990s at 8.5%, then declined and again hit the 8.0 percent range in the year 2000. They subsequently declined, hovering in the 4.5 to 5.0 percent range between 2003 and 2005. They increased to 6.0% in June 2006, declined and then once again increased to over 6.0% in the summer of 2007. They retreated to the 5.50% range by the end of 2007. Page 2 provides the dividend yields for the fifteen utilities in the Dow Jones Utilities Average over the past decade. These yields peaked in 1994 at 7.2% and have gradually declined over the past decade. As of 2007, these yields were 3.35%.

[4] R-square measures the percent of variation in one variable (e.g., market-to-book ratios) explained by another variable (e.g., expected return on equity). R-squares vary between zero and 1.0, with values closer to 1.0 indicating a higher relationship between two variables.

Average earned returns on common equity and market-to-book ratios are given on page 3 of Exhibit JRW-7. Over the past decade, earned returns on common equity have consistently been in the 11.0%-13.0% range. The average ROE peaked at 13.45% in 2001 and subsequently declined through the year 2006 before recovering in 2007. Over the past decade, market-to-book ratios for this group have increased gradually but with several ups and downs. The market-to-book average was 1.83 as of 2001, declined to 1.50 in 2003 and increased to 2.2 as of 2007.

The indicators in Exhibit JRW-7, coupled with the overall decrease in interest rates, suggest that capital costs for the Dow Jones Utilities have decreased over the past decade.

***Q20. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED RATE OF RETURN ON EQUITY?***

***A20.*** The expected or required rate of return on common stock is a function of market-wide, as well as company-specific, factors. The most important market factor is the time value of money as indicated by the level of interest rates in the economy. Common stock investor requirements generally increase and decrease with like changes in interest rates. The perceived risk of a firm is the predominant factor that influences investor return requirements on a company-specific basis. A firm's investment risk is often separated into business and financial risk. Business risk encompasses all factors that affect a firm's operating revenues and

expenses. Financial risk results from incurring fixed obligations in the form of debt in financing its assets.

***Q21. HOW DOES THE INVESTMENT RISK OF PUBLIC UTILITY COMPANIES COMPARE WITH THAT OF OTHER INDUSTRIES?***

*A21.* Due to the essential nature of their service as well as their regulated status, public utilities are exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively low level of business risk allows public utilities to meet much of their capital requirements through borrowing in the financial markets, thereby incurring greater than average financial risk. Nonetheless, the overall investment risk of public utilities is below most other industries.

Exhibit JRW-8 provides an assessment of investment risk for 100 industries as measured by beta, which according to modern capital market theory is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey* and are compiled by Aswath Damodoran of New York University.[5] The study shows that the investment risk of public utilities is relatively low. The average beta for electric utility industry is 0.88. This figure put electric utility companies in the bottom twenty percent of all industries and well below the *Value Line* average of 1.24. As such, the cost of equity for the electric utility industry is relatively low compared to other industries in the U.S.

[5] They may be found on the Internet at http:// www.stern.nyu.edu/~adamodar.

***Q22. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON EQUITY CAPITAL BE DETERMINED?***

*A22.* The costs of debt and preferred stock are normally based on historical or book values and can be determined with a great degree of accuracy. The cost of common equity capital, however, cannot be determined precisely and must instead be estimated from market data and informed judgment. This return to the stockholder should be commensurate with returns on investments in other enterprises having comparable risks.

According to valuation principles, the present value of an asset equals the discounted value of its expected future cash flows. Investors discount these expected cash flows at their required rate of return that, as noted above, reflect the time value of money and the perceived riskiness of the expected future cash flows. As such, the cost of common equity is the rate at which investors discount expected cash flows associated with common stock ownership.

Models have been developed to ascertain the cost of common equity capital for a firm. Each model, however, has been developed using restrictive economic assumptions. Consequently, judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of common equity capital, in determining the data inputs for these models, and in interpreting the models' results. All of these decisions must take into consideration the firm involved as well as current conditions in the economy and the financial markets.

***Q23. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR THE COMPANY?***

*A23.* I rely primarily on the DCF model to estimate the cost of equity capital. Given the investment valuation process and the relative stability of the utility business, I believe that the DCF model provides the best measure of equity cost rates for public utilities. It is my experience that this Commission has traditionally relied on the DCF method. I have also performed a CAPM study, but I give these results less weight because I believe that risk premium studies, of which the CAPM is one form, provide a less reliable indication of equity cost rates for public utilities.

**B. Discounted Cash Flow Analysis**

***Q24. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.***

*A24.* According to the DCF model, the current stock price is equal to the discounted value of all future dividends that investors expect to receive from investment in the firm. As such, stockholders' returns ultimately result from current as well as future dividends. As owners of a corporation, common stockholders are entitled to a pro-rata share of the firm's earnings. The DCF model presumes that earnings that are not paid out in the form of dividends are reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at which investors discount future dividends, which reflects the timing and riskiness of the expected cash flows, is interpreted as the market's expected or required return on the

common stock. Therefore, this discount rate represents the cost of common equity. Algebraically, the DCF model can be expressed as:

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

where P is the current stock price, $D_n$ is the dividend in year n, and k is the cost of common equity.

***Q25. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?***

*A25.* Yes. Virtually all investment firms use some form of the DCF model as a valuation technique. One common application for investment firms is called the three-stage DCF or dividend discount model ("DDM"). The stages in a three-stage DCF model are presented in Exhibit JRW-9. This model presumes that a company's dividend payout progresses initially through a growth stage, then proceeds through a transition stage, and finally assumes a steady-state stage. The dividend-payment stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a function of the life cycle of the product or service.

1. Growth stage: Characterized by rapidly expanding sales, high profit margins, and abnormally high growth in earnings per share. Because of highly profitable expected investment opportunities, the payout ratio is low. Competitors are attracted by the unusually high earnings, leading to a decline in the growth rate.

2. Transition stage: In later years, increased competition reduces profit margins and earnings growth slows. With fewer new investment opportunities, the company begins to pay out a larger percentage of earnings.

3. Maturity (steady-state) stage: Eventually the company reaches a position where its new investment opportunities offer, on average, only slightly attractive returns on equity. At that time its earnings growth rate, payout ratio, and return on equity stabilize for the remainder of its life. The constant-growth DCF model is appropriate when a firm is in the maturity stage of the life cycle.

In using this model to estimate a firm's cost of equity capital, dividends are projected into the future using the different growth rates in the alternative stages, and then the equity cost rate is the discount rate that equates the present value of the future dividends to the current stock price.

***Q26. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?***

*A26.* Under certain assumptions, including a constant and infinite expected growth rate, and constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the following:

$$P = \frac{D_1}{k - g}$$

where $D_1$ represents the expected dividend over the coming year and g is the expected growth rate of dividends. This is known as the constant-growth version of the DCF model. To use the constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above expression to obtain the following:

$$k = \frac{D_1}{P} + g$$

***Q27. IN YOUR OPINION, IS THE CONSTANT-GROWTH DCF MODEL APPROPRIATE FOR PUBLIC UTILITIES?***

*A27.* Yes. The economics of the public utility business indicate that the industry is in the steady-state or constant-growth stage of a three-stage DCF. The economics include the relative stability of the utility business, the maturity of the demand for public utility services, and the regulated status of public utilities (especially the fact that their returns on investment are effectively set through the ratemaking process). The DCF valuation procedure for companies in this stage is the constant-growth DCF. In the constant-growth version of the DCF model, the current dividend payment and stock price are directly observable. However, the primary problem and controversy in applying the DCF model to estimate equity cost rates entails estimating investors' expected dividend growth rate.

***Q28. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?***

*A28.* One should be sensitive to several factors when using the DCF model to estimate a firm's cost of equity capital. In general, one must recognize the assumptions under which the DCF model was developed in estimating its components (the dividend yield and expected growth rate). The dividend yield can be measured precisely at any point in time, but tends to vary somewhat over time. Estimation of expected growth is considerably more difficult. One must consider recent firm performance, in conjunction with current economic developments and other information available to investors, to accurately estimate investors' expectations.

***Q29. PLEASE DISCUSS YOUR DCF ANALYSIS.***

*A29.* My DCF analysis is provided in Exhibit JRW-10. The DCF summary is on page 1 of this Exhibit, and the supporting data and analysis for the dividend yield and expected growth rate are provided on the following pages of the Exhibit.

***Q30. WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF ANALYSIS FOR THE PROXY GROUP?***

*A30.* The dividend yields on the common stock for the companies in the proxy group are provided on page 2 of Exhibit JRW-10 for the six-month period ending January 2009. For the DCF dividend yields for the group, I am using the average of the six month, including January 2009 dividend yields, which is 5.3%.

***Q31. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT DIVIDEND YIELD.***

*A31.* According to the traditional DCF model, the dividend yield term relates to the dividend yield over the coming period. As indicated by Professor Myron Gordon, who is commonly associated with the development of the DCF model for popular use, this is obtained by: (1) multiplying the expected dividend over the coming quarter by 4 and (2) dividing this dividend by the current stock price to determine the appropriate dividend yield for a firm, that pays dividends on a quarterly basis.[6] In applying the DCF model, some analysts adjust the current dividend for growth over the coming year as opposed to the coming quarter. This can be complicated because firms tend to announce changes in dividends at different times during the year. As such, the dividend yield computed based on presumed growth over the coming quarter as opposed to the coming year can be quite different. Consequently, it is common for analysts to adjust the dividend yield by some fraction of the long-term expected growth rate.

***Q32. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE FOR YOUR DIVIDEND YIELD?***

*A32.* I will adjust the dividend yield by one-half (1/2) the expected growth so as to reflect growth over the coming year.

***Q33. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.***

[6] *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05, Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

*A33.* There is much debate as to the proper methodology to employ in estimating the growth component of the DCF model. By definition, this component is investors' expectation of the long-term dividend growth rate. Presumably, investors use some combination of historical and/or projected growth rates for earnings and dividends per share and for internal or book value growth to assess long-term potential.

***Q34. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY GROUP?***

*A34.* I have analyzed a number of measures of growth for companies in the proxy group. I have reviewed *Value Line's* historical and projected growth rate estimates for earnings per share ("EPS"), dividends per share ("DPS"), and book value per share ("BVPS"). In addition, I have utilized the average EPS growth rate forecasts of Wall Street analysts as provided by Bloomberg, and Zacks. These services solicit five-year earnings growth rate projections from securities analysts, and compile and publish the means and medians of these forecasts. Finally, I have also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

***Q35. PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND DIVIDENDS AS WELL AS INTERNAL GROWTH.***

*A35.* Historical growth rates for EPS, DPS, and BVPS are readily available to virtually all investors and presumably an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as

measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). However, one must appraise the context in which the growth rate is being employed. According to the conventional DCF model, the expected return on a security is equal to the sum of the dividend yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of common equity capital using the conventional DCF model, one must look to long-term growth rate expectations.

Internally generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. Internal growth is significant in determining long-run earnings and, therefore, dividends. Investors recognize the importance of internally generated growth and pay premiums for stocks of companies that retain earnings and earn high returns on internal investments.

***Q36. WHY ARE YOU NOT RELYING EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE FOR THE PROXY GROUP?***

*A36.* There are several issues with using the EPS growth rate forecasts of Wall Street analysts as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Nonetheless, over the very long-term, dividend and earnings will have to grow at a similar growth rate. Therefore, in my opinion, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, and most significantly, it is well-known that the EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. This issue is discussed at length in the rebuttal section of this testimony.

***Q37. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE GROUP AS PROVIDED IN THE VALUE LINE INVESTMENT SURVEY.***

*A37.* Historic growth rates for the companies in the group, as published in the *Value Line Investment Survey*, are provided on page 3 of Exhibit JRW-10. Due to the presence of outliers among the historic growth rate figures, both the mean and medians are used in the analysis.[7] The historical growth measures in EPS, DPS, and BVPS for the Electric Proxy Group, as measured by the means and medians, range from -2.3% to 3.0%, with an average of 1.0%.

[7] Outliers are observations that are much larger or smaller than the majority of the observations that are being evaluated.

***Q38. PLEASE SUMMARIZE VALUE LINE'S PROJECTED GROWTH RATES FOR THE COMPANIES IN THE PROXY GROUP.***

*A38.* *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy group are shown on page 4 of Exhibit JRW-10. As stated above, due to the presence of outliers, both the mean and medians are used in the analysis. For the Electric Proxy Group, the central tendency measures range from 1.0% to 6.2 %, with an average of 3.6%.

Also provided on page 4 of Exhibit JRW-10 is prospective internal growth for the proxy group as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, internal growth is a significant primary driver of long-run earnings growth. For the Electric Proxy Group, the average prospective internal growth rate is 3.6%.

***Q39. PLEASE ASSESS GROWTH FOR THE PROXY GROUP AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH.***

*A39.* Zacks, and Bloomberg collect, summarize, and publish Wall Street analysts' five-year EPS growth rate forecasts for the companies in the proxy group. These forecasts are provided for the companies in the proxy group on page 5 of Exhibit JRW-10. The average of the means and medians of analysts' projected EPS growth rates for the Electric Proxy Group is 6.50%.[8]

[8] Since there is considerable overlap in analyst coverage between the three services, and not all of the companies have forecasts from the different services, I have averaged the expected five-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate by company.

***Q40. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUP.***

*A40.* Page 6 of Exhibit JRW-10 shows the summary DCF growth rate indicators for the proxy group. The average of the historic and projected growth rate indicators for the Electric Proxy Group is 3.7%. The average of the projected growth rate indicators and internal growth, excluding historical growth, is 4.6%. I will use this figure as the expected DCF growth rate for the Electric Proxy Group.

***Q41. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE GROUP?***

*A41.* My DCF-derived equity cost rate for the group is summarized on page 1 of Exhibit JRW-10.

$$\text{DCF Equity Cost Rate (k)} = \frac{D}{P} + g$$

$$\text{DCF Equity Cost Rate (k)} = 5.3\% + 4.6\% = 10.0\%$$

**C. Capital Asset Pricing Model Results**

***Q42. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("CAPM").***

***A42.*** The CAPM is a risk premium approach to gauging a firm's cost of equity capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on a risk-free bond ($R_f$) and a risk premium (RP), as in the following:

$$k = R_f + RP$$

The yield on long-term Treasury securities is normally used as $R_f$. Risk premiums are measured in different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk, and market or systematic risk, which is measured by a firm's beta. The only risk that investors receive a return for bearing is systematic risk.

According to the CAPM, the expected return on a company's stock, which is also the equity cost rate (K), is equal to:

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

Where:

- *K* represents the estimated rate of return on the stock;
- $E(R_m)$ represents the expected return on the overall stock market. Frequently, the 'market' refers to the S&P 500;
- $(R_f)$ represents the risk-free rate of interest;
- $[E(R_m) - (R_f)]$ represents the expected equity or market risk premium—the excess return that an investor expects to receive above the risk-free rate for investing in risky stocks; and
- *Beta*—(ß) is a measure of the systematic risk of an asset.

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest ($R_f$), the beta (ß), and the expected equity or

market risk premium $[E(R_m) - (R_f)]$. $R_f$ is the easiest of the inputs to measure – it is the yield on long-term Treasury bonds. ß, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to historical betas due to their tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the expected equity or market risk premium $(E(R_m) - (R_f))$. I will discuss each of these inputs below.

***Q43. PLEASE DISCUSS YOUR CAPM RESULTS.***

*A43.* Exhibit JRW-11 provides the summary results for my CAPM study. Page 1 shows the results, and the following pages contain the supporting data.

***Q44. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.***

*A44.* The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds, in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year maturities. However, when the Treasury's issuance of 30-year bonds was interrupted for a period of time in recent years, the yield on 10-year U.S. Treasury bonds replaced the yield on 30-year U.S. Treasury bonds as the benchmark long-term Treasury rate. The 10-year U.S. Treasury yields over the past five years are shown on page 2 of Exhibit JRW-11. These rates hit a 60-year low in the summer of 2003 at 3.33%. They increased with the rebounding economy and fluctuated in the 4.0-4.50 percent range in recent years until advancing to 5.0% in early 2006 in

response to a strong economy and increases in energy, commodity, and consumer prices. In late 2006, long-term interest rates retreated to the 4.5 percent area as commodity and energy prices declined and inflationary pressures subsided. These rates rebounded to the 5.0% level in the first half of 2007. However, over the following year, ten-year Treasury yields fell below 4.0% due to the housing and sub-prime mortgage crises and its affect on the economy and financial markets. In the fourth quarter of 2008 long-term Treasury yields were pushed even lower as the mortgage and sub-prime market credit crisis led to turmoil in the financial sector, uncertainty with respect to the length of the economic recession, and the government bailout of financial institutions. In total, these developments have led to a flight to quality in the bond market which has driven Treasury yields to historic low levels.

***Q45. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?***

***A45.*** The U.S. Treasury began to issue the 30-year bond in the early 2000s as the U.S. budget deficit increased. As such, the market has once again focused on its yield as the benchmark for long-term capital costs in the U.S. As noted above, the yields on the 10- and 30- year U.S. Treasuries have decreased to historically low levels as a result of the mortgage and sub-prime market credit crisis, the turmoil in the financial sector, the prospect of an economic recession, and the government bailout of financial institutions. As of January 6, 2009, as shown on page 2 of Exhibit JRW-11, the rates on 10- and 30- U.S. Treasury Bonds were 2.51% and 3.11%, respectively. However, these yields have been highly volatile over the past three months. Given this recent range and volatility, along with the prospect of

higher rates, I believe that a long-term Treasury rate in the 3.0%-4.0% is reasonable for the near future. I will use the midpoint of this range, 3.5%, as the risk-free rate, or $R_f$, in my CAPM.

***Q46. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?***

***A46.*** Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken to be the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below average price movement, such as that of a regulated public utility, is less risky than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.

As shown on page 3 of Exhibit JRW-11, the slope of the regression line is the stock's ß. A steeper line indicates the stock is more sensitive to the return on the overall market. This means that the stock has a higher ß and greater than average market risk. A less steep line indicates a lower ß and less market risk.

Numerous online investment information services, such as Yahoo! and Reuters, provide estimates of stock betas. These services routinely report different betas for the same stock. The differences are usually due to: (1) the time period over which the ß is measured and (2) any adjustments that are made to reflect the fact

that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the proxy group, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-11, the average beta for the companies in Electric Proxy Group is 0.75.

***Q47. PLEASE DISCUSS THE OPPOSING VIEWS REGARDING THE EQUITY RISK PREMIUM.***

*A47.* The equity or market risk premium - $(E(R_m) - R_f)$ - is equal to the expected return on the stock market (e.g., the expected return on the S&P 500 ($E(R_m)$) minus the risk-free rate of interest ($R_f$). The equity premium is the difference in the expected total return between investing in equities and investing in "safe" fixed-income assets, such as long-term government bonds. However, while the equity risk premium is easy to define conceptually, it is difficult to measure because it requires an estimate of the expected return on the market.

***Q48. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE EQUITY RISK PREMIUM.***

*A48.* Page 4 of Exhibit JRW-11 highlights the primary approaches to, and issues in, estimating the expected equity risk premium. The traditional way to measure the equity risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called ex post returns, were used as the measures of the market's expected return (known as the ex ante or forward-looking expected return). This type of historical evaluation

of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson who popularized this method of using historical financial market returns as measures of expected returns. Most historical assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the rate on long-term U.S. Treasury bonds. However, this can be a problem because: (1) ex post returns are not the same as ex ante expectations, (2) market risk premiums can change over time; increasing when investors become more risk-averse and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historical returns are poor estimates of ex ante expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies.[9] The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[10]

[9] The problems with using ex post historical returns as measures of ex ante expectations will be discussed at length later in my testimony.

[10] R. Mehra and Edward Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economics* (1985).

***Q49. PLEASE SUMMARIZE SOME OF THE ACADEMIC STUDIES THAT DEVELOP EX ANTE EQUITY RISK PREMIUMS.***

*A49.* Two of the most prominent studies of ex ante expected equity risk premiums were by Eugene Fama and Ken French (2002) and James Claus and Jacob Thomas (2001). The primary debate in these studies revolves around two related issues: (1) the size of expected equity risk premium, which is the return equity investors require above the yield on bonds and (2) the fact that estimates of the ex ante expected equity risk premium using fundamental firm data (earnings and dividends) are much lower than estimates using historical stock and bond return data.

Fama and French (2002), two of the most preeminent scholars in finance, use dividend and earnings growth models to estimate expected stock returns and ex ante expected equity risk premiums.[11] They compare these results to actual stock returns over the period 1951-2000. Fama and French estimate that the expected equity risk premium from DCF models using dividend and earnings growth to be between 2.55% and 4.32%. These figures are much lower than the ex post historical equity risk premium produced from the average stock and bond return over the same period, which is 7.40%. Fama and French conclude that the ex ante equity risk premium estimates using DCF models and fundamental data are superior to those using ex post historical stock returns for three reasons: (1) the estimates are more precise (a lower standard error); (2) the Sharpe ratio, which is

[11] Eugene F. Fama and Kenneth R. French, "The Equity Premium," *The Journal of Finance*, (April 2002).

measured as the [(expected stock return – risk-free rate)/standard deviation], is constant over time for the DCF models but varies considerably over time and more than doubles for the average stock-bond return model; and (3) valuation theory specifies relationships between the market-to-book ratio, return on investment, and cost of equity capital that favor estimates from fundamentals. They also conclude that the high average stock returns over the past 50 years were the result of low expected returns and that the average equity risk premium has been in the 3-4 percent range.

The study by Claus and Thomas of Columbia University provides direct support for the findings of Fama and French.[12] These authors compute ex ante expected equity risk premiums over the 1985-1998 period by: (1) computing the discount rate that equates market values with the present value of expected future cash flows and (2) then subtracting the risk-free interest rate. The expected cash flows are developed using analysts' earnings forecasts. The authors conclude that over this period, the ex ante expected equity risk premium is in the range of 3.0%. Claus and Thomas note that, over this period, ex post historical stock returns overstate the ex ante expected equity risk premium because, as the expected equity risk premium has declined, stock prices have risen. In other words, from a valuation perspective, the present value of expected future returns increases when the required rate of return decreases. The higher stock prices have produced stock

[12] James Claus and Jacob Thomas, "Equity Risk Premia as Low as Three Percent? Empirical Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Market," *Journal of Finance*. (October 2001).

returns that have exceeded investors' expectations, and therefore, ex post historical equity risk premium estimates are biased upwards as measures of ex ante expected equity risk premiums.

***Q50. PLEASE PROVIDE A SUMMARY OF THE EQUITY RISK PREMIUM STUDIES.***

*A50.* Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the most comprehensive reviews to date of the research on the equity risk premium.[13] Derrig and Orr's study evaluated the various approaches to estimating equity risk premiums as well as the issues with the alternative approaches and summarized the findings of the published research on the equity risk premium. Fernandez examined four alternative measures of the equity risk premium – historical, expected, required, and implied. He also reviewed the major studies of the equity risk premium and presented the summary equity risk premium results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the equity risk premium.

Page 5 of Exhibit JRW-11 provides a summary of the results of the primary risk premium studies reviewed by Derrig and Orr, Fernandez, and Song. In developing page 5 of Exhibit JRW-11, I have categorized the studies as discussed on page 4 of Exhibit JRW-11. I have also included the results of the "Building

[13] Richard Derrig and Elisha Orr, "Equity Risk Premium: Expectations Great and Small," Working Paper (version 3.0), Automobile Insurers Bureau of Massachusetts, (August 28, 2003), Pablo Fernandez, "Equity Premium: Historical, Expected, Required, and Implied," IESE Business School Working Paper, (2007), and Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

Blocks" approach to estimating the equity risk premium, including a study I performed, which is presented below. The Building Blocks approach is a hybrid approach employing elements of both historic and ex ante models.

***Q51. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EQUITY RISK PREMIUM COMPUTED USING THE BUILDING BLOCKS METHODOLOGY.***

*A51.* Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[14] They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings ("P/E") ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment ("INT").[15] This is shown on page 6 of Exhibit JRW-11. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return

[14] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January 2003).

[15] Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003), p. 11.

components demanded by investors: the historical U.S. Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%), real earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small interaction term (0.2%).

***Q52. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE EXPECTED EQUITY RISK PREMIUM?***

*A52.* The third column in the graph above shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. Page 7 of Exhibit JRW-11 shows the expected annual inflation rate according to consumers, as measured by the CPI, over the coming year. This survey is published monthly by the University of Michigan Survey Research Center. In the most recent report, the expected one-year inflation rate was 2.9%.

Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters.*[16] This

[16]Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters,* (February 12, 2008). The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association ("ASA") and the National Bureau of Economic Research ("NBER") and was known as the ASA/NBER survey. The survey, which began in 1968, is conducted each quarter. The Federal Reserve Bank of Philadelphia, in cooperation with the NBER, assumed responsibility for the survey in June 1990.

survey of professional economists has been published for almost 50 years. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of gross domestic product ("GDP") growth, inflation, and market returns. In the first quarter 2008 survey, published on February 12, 2008, the median long-term (10-year) expected inflation rate as measured by the CPI was 2.5% (see page 8 of Exhibit JRW-11).

Given these results, I will use the average of the surveys of the University of Michigan and Federal Reserve Bank of Philadelphia (2.9% and 2.5%), or 2.7%.

D/P – As shown on page 9 of Exhibit JRW-11, the dividend yield on the S&P 500 has decreased gradually over the past decade. Today, it is below its average of 4.3% over the 1926-2000 time period. Whereas the S&P dividend yield bottomed out at less than 1.4% in 2000, it is currently at 3.1% which I use in the ex ante risk premium analysis.

RG – To measure expected real growth in earnings, I use: (1) the historical real earnings growth rate for the S&P 500 and (2) expected real GDP growth. The S&P 500 was created in 1960. It includes 500 companies which come from ten different sectors of the economy. Over the 1960-2007 period, nominal growth in EPS for the S&P 500 was 7.36%. On page 10 of Exhibit JRW-11, real EPS growth is computed using the CPI as a measure of inflation. As indicated by

Ibbotson and Chen, real earnings growth over the 1926-2000 period was 1.8%. The real growth figure over 1960-2007 period for the S&P 500 is 3.0 %.

The second input for expected real earnings growth is expected real GDP growth. The rationale is that over the long-term, corporate profits have averaged a relatively consistent 5.50% of U.S. GDP.[17] Real GDP growth, according to McKinsey, has averaged 3.5% over the past 80 years. Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.75% (see page 8 of Exhibit JRW-11).

Given these results, I will use the average of the historical S&P EPS real growth and the projected real GDP growth (as reported by the Federal Reserve Bank of Philadelphia Survey) -- 3.0% and 2.75% -- or 2.85%, for real earnings growth.

PEGAIN – PEGAIN is the repricing gain associated with an increase in the P/E ratio. It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock market return, one issue is whether investors expect P/E ratios to increase from their current levels. The P/E ratios for the S&P 500 over the past 25 years are shown on page 9 of Exhibit JRW-11. The run-up and eventual peak in P/Es is most notable in the chart. The

[17]Marc. H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.14.

relatively low P/E ratios (in the range of 10) over two decades ago are also quite notable. As of November 30, 2008, the P/E for the S&P 500 was 19.44.[18]

Given the current economic and capital markets environment, I do not believe that investors expect even higher P/E ratios. Therefore, a PEGAIN would not be appropriate in estimating an ex ante expected stock market return. There are two primary reasons for this. First, the average historical S&P 500 P/E ratio is 15.74 – thus the current P/E exceeds this figure. Second, as previously noted, interest rates are at a cyclical low not seen in almost 50 years. This is a primary reason for the high current P/Es. Given the current market environment with relatively high P/E ratios and low relative interest rates, investors are not likely to expect to get stock market gains from lower interest rates and higher P/E ratios.

***Q53. GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED MARKET RETURN AND EQUITY RISK PREMIUM USING THE "BUILDING BLOCKS METHODOLOGY"?***

*A53.* My expected market return is represented by the last column on the right in the graph entitled "Decomposing Equity Market Returns: The Building Blocks Methodology" set forth on page 6 of Exhibit JRW-11. As shown, my expected market return of 8.65% is composed of 2.70% expected inflation, 3.10% dividend yield, and 2.85% real earnings growth rate.

[18] Source: www.standardandpoors.com.

***Q54. GIVEN THAT THE HISTORICAL COMPOUNDED ANNUAL MARKET RETURN IS IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET RETURN OF 8.65% IS REASONABLE?***

*A54.* As discussed above, in the development of the expected market return, stock prices are relatively high at the present time in relation to earnings and dividends, and interest rates are relatively low. Hence, it is unlikely that investors are going to experience high stock market returns due to higher P/E ratios and/or lower interest rates. In addition, as shown in the decomposition of equity market returns, whereas the dividend portion of the return was historically 4.3%, the current dividend yield is only 3.1%. Due to these reasons, lower market returns are expected for the future.

***Q55. IS YOUR EXPECTED MARKET RETURN OF 8.65% CONSISTENT WITH THE FORECASTS OF MARKET PROFESSIONALS?***

*A55.* Yes. In the first quarter 2008 *Survey of Financial Forecasters*, published on February 12, 2008, by the Federal Reserve Bank of Philadelphia, the mean long-term expected return on the S&P 500 was 6.8% (see page 8 of Exhibit JRW-11).

***Q56. IS YOUR EXPECTED MARKET RETURN CONSISTENT WITH THE EXPECTED MARKET RETURNS OF CORPORATE CHIEF FINANCIAL OFFICERS (CFOs)?***

***A56.*** Yes. John Graham and Campbell Harvey of Duke University conduct a quarterly survey of corporate CFOs. The survey is a joint project of Duke University and *CFO Magazine*. In the December 2008 survey, the mean expected return on the S&P 500 over the next ten years was 8.30%.[19]

***Q57. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS YOUR EX ANTE EQUITY RISK PREMIUM USING THE BUILDING BLOCKS METHODOLOGY?***

***A57.*** As shown on page 2 of Exhibit JRW-11, the current 30-year U.S. Treasury yield is 3.11%. My ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

$$\text{Ex Ante Equity Risk Premium} = 8.65\% - 3.11\% = 5.54\%$$

***Q58. GIVEN THIS DISCUSSION, HOW ARE YOU MEASURING AN EXPECTED EQUITY RISK PREMIUM IN THIS PROCEEDING?***

***A58.*** As discussed above, page 5 of Exhibit JRW-11 provides a summary of the results of the equity risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) ex ante equity risk premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters, and academics, and (4) the Building Block approaches to the equity risk premium. There are results reported for over thirty studies, and the average equity risk

[19] The survey results are available at www.cfosurvey.org.

premium is 4.77%, which I will use as the equity risk premium in my CAPM study.

***Q59. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF LEADING INVESTMENT PROFESSIONALS?***

*A59.* My current supply-side equity risk premium is above those used by leading investment firms, CFOs, financial forecasters, and management consulting firms. In terms of investment firms, one of the first studies in this area was by Stephen Einhorn, one of Wall Street's leading investment strategists.[20] His study showed that the market or equity risk premium had declined to the 2.0 - 3.0 percent range by the early 1990s. Among the evidence he provided in support of a lower equity risk premium is the inverse relationship between real interest rates (observed interest rates minus inflation) and stock prices. He noted that the decline in the market risk premium has led to a significant change in the relationship between interest rates and stock prices. One implication of this development was that stock prices had increased higher than would be suggested by the historical relationship between valuation levels and interest rates.

The equity risk premiums of some of the other leading investment firms support the result of the academic studies. An article in *The Economist* indicated that

[20] Steven G. Einhorn, "The Perplexing Issue of Valuation: Will the Real Value Please Stand Up?" *Financial Analysts Journal* (July-August 1990), pp. 11-16.

some other firms like J.P. Morgan are estimating an equity risk premium for an average risk stock in the 2.0 - 3.0 percent range above the interest rate on U.S. Treasury Bonds.[21]

***Q60. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY CFOs?***

*A60.* Again, my equity risk premium is a little high compared to the equity risk premiums of CFOs. In the previously referenced December 2008 CFO survey conducted by *CFO Magazine* and Duke University, the expected 10-year equity risk premium was 5.00%.

***Q61. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EX ANTE EQUITY RISK PREMIUMS OF PROFESSIONAL FORECASTERS?***

*A61.* Again, my equity risk premium is higher. The financial forecasters in the previously referenced Federal Reserve Bank of Philadelphia survey project both stock and bond returns. As shown on page 8 of Exhibit JRW-11, the mean long-term expected stock and bond returns were 6.80% and 4.84%, respectively. This provides an ex ante equity risk premium of 1.96%.

[21] For example, see "Welcome to Bull Country," *The Economist* (July 18, 1998), pp. 21-3, and "Choosing the Right Mixture," *The Economist* (February 27, 1999), pp. 71-2.

***Q62. WHAT ARE THE EQUITY RISK PREMIUMs USED BY THE LEADING CONSULTING FIRMS?***

*A62.* McKinsey & Co. is widely recognized as the leading management consulting firm in the world. It published a study entitled "The Real Cost of Equity" in which the McKinsey authors developed an ex ante equity risk premium for the U.S. In reference to the decline in the equity risk premium, as well as what is the appropriate equity risk premium to employ for corporate valuation purposes, the McKinsey authors concluded the following:

> We attribute this decline not to equities becoming less risky (the inflation-adjusted cost of equity has not changed) but to investors demanding higher returns in real terms on government bonds after the inflation shocks of the late 1970s and early 1980s. We believe that using an equity risk premium of 3.5 to 4 percent in the current environment better reflects the true long-term opportunity cost of equity capital and hence will yield more accurate valuations for companies.[22]

***Q63. WHAT EQUITY COST RATES ARE INDICATED BY YOUR CAPM ANALYSIS?***

*A63.* The results of my CAPM study for the proxy group are provided below:

$$K = (R_f) + \beta * [E(R_m) - (R_f)]$$
$$K = 3.5\% + 0.75 * 4.77\%$$
$$K = 7.1\%$$

[22] Marc H. Goedhart, et al, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p. 15.

## VI. EQUITY COST RATE SUMMARY

***Q64. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.***

***A64.*** The results for my DCF and CAPM analyses for the Electric Proxy Group indicates equity cost rates of 10.0% and 7.1%, respectively.

***Q65. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR the GROUP?***

***A65.*** Given these results, I conclude that the appropriate equity cost rate for the Electric Proxy Group is in the 7.1%-10.0% range. This broad range, in my opinion, reflects the current volatile capital market conditions which were discussed above. In light of these market conditions, I am using the upper end of the range as the equity cost rate for Dayton. Therefore, I am recommending an equity cost rate of 9.75% for Dayton. In using the upper end of the range, I am effectively incorporating a very high equity risk premium into my recommendation. This is in recognition of the current market conditions.

***Q66. HOW DO YOU TEST THE REASONABLENESS OF YOUR COST OF EQUITY AND OVERALL RATE OF RETURN RECOMMENDATION?***

***A66.*** To test the reasonableness of my equity cost rate recommendation, I examine the relationship between the return on common equity and the market-to-book ratios for the companies in the Electric Proxy Group.

***Q67. WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-BOOK RATIOS FOR THE PROXY GROUP INDICATE ABOUT THE REASONABLENESS OF YOUR RECOMMENDATION?***

*A67.* Exhibit JRW-4 provides financial performance and market valuation statistics for companies in the proxy group. The mean current return on equity and market-to-book ratio for the group are 8.6% and 1.35, respectively. These results indicate that, on average, these companies are earning returns on equity above their equity cost rates. As such, this observation provides evidence that my recommended equity cost rate is reasonable and fully consistent with the financial performance and market valuation of the proxy group of electric utility companies.

## VII. CRITIQUE OF DAYTON'S RATE OF RETURN TESTIMONY

***Q68. DO YOU HAVE CONCERNS ABOUT THE COMPANY'S COST OF CAPITAL POSITION?***

*A68.* Yes. I have concerns about Dr. Makholm's recommended capital structure, and equity cost rate.

***Q69. PLEASE EVALUATE THE COMPANY'S RECOMMENDED CAPITAL STRUCTURE.***

*A69.* As previously discussed, the Company's projected capital structure is not appropriate for ratemaking purposes in this proceeding. The recommended capital structure is equity rich and has a much higher common equity ratio than that

employed by other electric utility companies. Further, the capital structure recommended by the Company is a hypothetical capital structure, which I understand and OCC counsel has confirmed is inconsistent with Ohio law and the precedent established in Commission proceedings[23] The Commission has stated:

> A hypothetical capital structure produces distorted results because the costs associated with the various components of the capital structure are a function of the existing capitalization.
>
> * * *
>
> In addition, because a potential investor considers actual capital structure in making his or her investment decisions, the use of a *hypothetical capital* structure, which does not necessarily correspond to the applicant's capital structure at any point in time, is inappropriate.[24]

Therefore, the capital structure recommended by Dr. Makholm should be rejected by the Commission.

***Q70. PLEASE REVIEW DR. MAKHOLM'S EQUITY COST RATE APPROACHES.***

[23] *In re Toledo Edison Company*, Case No. 81-620-EL-AIR, Order (June 9, 1982) ("To treat the exchange as if it had not occurred . . . would require us to determine the weighted cost of capital with reference to a *hypothetical capital* structure, a measure we have consistently rejected . . . . Further, such an approach runs afoul of the provision of §4909.15(D)(2)(a), Revised Code, which requires the commission to employ a cost rate for debt which reflects the actual embedded cost of debt of the utility in question for purposes of the rate of return determination." Emphasis).

[24] *In re Dayton Power and Light Company*, Case No. 81-1256-EL-AIR, Order (December 22, 1982), 50 P.U.R.4th 457, 472-473.

*A70.* Dr. Makholm uses a proxy group of utility companies and employs CAPM and DCF equity cost rate approaches.

***Q71. PLEASE SUMMARIZE DR. MAKHOLM'S EQUITY COST RATE RESULTS.***

*A71.* Dr. Makholm's equity cost rate estimates for Dayton are summarized in Panel A of Exhibit JRW-12. Based on these figures, he concludes that the appropriate equity cost rate for the Company is 11.3%.

***Q72. PLEASE DISCUSS YOUR CONCERNS ABOUT DR. MAKHOLM'S RECOMMENDED EQUITY COST RATE.***

*A72.* Dr. Makholm's proposed return on common equity is too high primarily due to: (1) an inappropriate group of comparable companies; (2) the full-year adjustment to the dividend yield and an inflated growth rate in his DCF approach; (3) an adjustment for flotation costs; and (4) excessive equity risk premiums in his CAPM approaches.

**A. Comparable Electric Companies**

***Q73. PLEASE DISCUSS THE PROBLEM WITH DR. MAKHOLM'S ELECTRIC UTILITY GROUP.***

*A73.* Dr. Makholm's utility proxy group includes several companies that are not appropriate because their operating revenues are from sources other than regulated electric utility services. These companies, and their percent of regulated electric

revenues, include: Avista Corp. – 50%, MGE Energy – 59%, and Wisconsin Energy - 61%.

## B. DCF Approach

***Q74. PLEASE SUMMARIZE DR. MAKHOLM'S DCF ESTIMATES.***

*A74.* On pages 13-29 of his testimony and in Exhibits JDM-8 – JDM-14, Dr. Makholm develops an equity cost rate by applying a DCF model to his group of comparable companies. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Dr. Makholm makes two adjustments to the dividend yield. He adjusts the spot yield to reflect the quarterly payment of dividends, and he makes an ex-dividend adjustment to the stock price. Dr. Makholm uses three measures of expected growth for his DCF model. He uses the projected EPS growth rate forecasts from Zacks and *Value Line*. He also computes a sustainable growth rate measure, also known as b*r + s*v, which include internal growth (expected ROE * retention rate) and external growth (percent of new equity * market-to-book). Dr. Makholm then makes a selling and issuance cost adjustment to his DCF equity cost rate. Dr. Makholm's DCF results are provided in Panel B of Exhibit JRW-12. Based on these figures, Dr. Makholm claims that the DCF equity cost rate for Dayton is 11.0%.

***Q75. PLEASE EXPRESS YOUR CONCERNS ABOUT DR. MAKHOLM'S DCF STUDY.***

*A75.* I have four concerns regarding Dr. Makholm DCF equity cost rate. These include his comparable company group, the dividend yield adjustment, the DCF growth rate, and the flotation cost adjustment. The errors in the comparable company group were discussed above. The other issues are reviewed below.

## C. DCF Dividend Yield Adjustment

***Q76. PLEASE DISCUSS DR. MAKHOLM'S ADJUSTMENT TO THE DIVIDEND YIELD TO REFLECT THE QUARTERLY PAYMENT OF DIVIDENDS.***

*A76.* On pages 14-15 of his testimony, Dr. Makholm discusses his dividend yield adjustment to reflect the quarterly payment of dividends. This argument is in error and results in an overstated equity cost rate. First, as previously discussed, the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter multiplied by four. The quarterly adjustment procedure is clearly inconsistent with this approach.

Second, Dr. Makholm's approach presumes that investors require additional compensation during the coming year because their dividends are paid out quarterly instead of being paid all in a lump sum. Therefore, he compounds each dividend to the end of the year using the long-term growth rate as the compounding factor. The error in this logic and approach is that the investor receives the money from each quarterly dividend and has the option to reinvest it as he or she chooses. This reinvestment generates its own compounding, but it is

outside of the dividend payments of the issuing company. Dr. Makholm's approach simply serves to duplicate this compounding process, thereby inflating the return to the investor. Finally, the notion that an adjustment is required to reflect the quarterly timing issue is refuted in a study by Richard Bower of Dartmouth College. Bower acknowledges the timing issue and downward bias addressed by Dr. Makholm. However, he demonstrates that this does not result in a biased required rate of return. He provides the following assessment: [25]

> ... authors are correct when they say that the conventional cost of equity calculation is a downward-biased estimate of the market discount rate. They are not correct, however, in concluding that it has a bias as a measure of required return. As a measure of required return, the conventional cost of equity calculation (K*), ignoring quarterly compounding and even without adjustment for fractional periods, serves very well.

He also makes the following observation on the issue:

> Too many rate cases have come and gone, and too many utilities have survived and sustained market prices above book, to make downward bias in the conventional calculation of required return a likely reality.

[25] See Richard Bower, The N-Stage Discount Model and Required Return: A Comment," *Financial Review* (February 1992), pp 141-9.

## D. DCF Growth Rate

***Q77. PLEASE REVIEW DR. MAKHOLM'S DCF GROWTH RATE ESTIMATES.***

*A77.* Using his comparable group of companies, Dr. Makholm computes his DCF growth rate as the average of three growth rate measures: the projected EPS growth rate forecasts from Zacks and *Value Line* and his estimate of sustainable growth. The average is 6.41%.

***Q78. WHAT ARE THE ERRORS IN DR. MAKHOLM'S DCF GROWTH RATE ANALYSIS?***

*A78.* The primary error is that Dr. Makholm has relied excessively on projected EPS growth rate measures. According to the DCF model, growth refers to not only EPS growth but also DPS and BVPS growth as well. *Value Line*'s projected EPS, DPS, and BVPS growth rates for Dr. Makholm's proxy group are provided on page 1 of Exhibit JRW-13. Whereas *Value Line*'s projected EPS growth rate for the group is 6.4%, the projected growth rates for DPS and BVPS are only 5.2% and 4.8%, respectively. In addition, and most significantly, it is well-known that the EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. Furthermore, I provide evidence below that *Value Line*'s projected EPS growth rates are also overly optimistic. Hence, using these projected EPS growth rates as a DCF growth rate will provide an overstated equity cost rate.

***Q79. PLEASE DISCUSS DR. MAKHOLM'S SUSTAINABLE GROWTH ANALYSIS.***

*A79.* Dr. Makholm's sustainable growth rate analysis, as found in Exhibit JDM-10 for his proxy group, indicates an average growth rate for the group of 5.15%. The primary error with his approach is the growth rate figure which is higher than the average *Value Line*'s projected annual change figure which is only 4.8% ( as shown on page 1 of Exhibit JRW-13). This suggests that his methodology is flawed in that it produces higher sustainable growth rates (using *Value Line* data) than the sustainable growth that *Value Line* actually is forecasting.

***Q80. PLEASE REVIEW DR. MAKHOLM'S EXCESSIVE RELIANCE UPON THE PROJECTED EPS GROWTH RATE ESTIMATES OF WALL STREET ANALYSTS' AND VALUE LINE.***

**A80.** It seems highly unlikely that investors today would rely excessively on the forecasts of securities analysts and ignore historical growth in arriving at expected growth. It is well known in the academic world that the EPS forecasts of securities analysts are overly optimistic and biased upwards. In addition, as I show below, *Value Line*'s EPS forecasts are excessive and unrealistic.

***Q81. PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS.***

*A81.* Analysts' growth rate forecasts are collected and published by Bloomberg, Zacks, First Call, I/B/E/S, and Reuters. These services retrieve and compile EPS forecasts

from Wall Street analysts. These analysts come from both the sell side (Merrill Lynch, Paine Webber) and the buy side (Prudential Insurance, Fidelity).

The problem with using these forecasts to estimate a DCF growth rate is that the objectivity of Wall Street research has been challenged, and many have argued that analysts' EPS forecasts are overly optimistic and biased upwards. To evaluate the accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS growth rates with forecasted EPS growth rates on a quarterly basis over the past 20 years for all companies covered by the I/B/E/S data base. In Panel A of page 2 of Exhibit JRW-13, I show the average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5 year EPS growth rate for the past twenty years.

The following example shows how the results can be interpreted. For the 3-5year period prior to the first quarter of 1999, analysts had projected an EPS growth rate of 15.13%, but companies only generated an average annual EPS growth rate over the 3-5 years of 9.37%. This projected EPS growth rate figure represented the average projected growth rate for over 1,510 companies, with an average of 4.88 analysts' forecasts per company. For the entire twenty-year period of the study, for each quarter there were on average 5.60 analysts' EPS projections for 1,281 companies. Overall, my findings indicate that forecast errors for long-term estimates are predominantly positive, which indicates an upward bias in growth rate estimates. The mean and median forecast errors over the observation period are 143.06% and 75.08%, respectively. The forecast errors are negative for only

eleven of the eighty quarterly time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As shown in the figure below, the quarters with negative forecast errors were for the 3-5 year periods following earnings declines associated with the 1991 and 2001 economic recessions in the U.S. Thus, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

The average 3-5 year EPS growth rate projections for all companies provided in the I/B/E/S database on a quarterly basis from 1988 to 2007 are shown in Panel B of Exhibit JRW-13. In this graph, no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, since companies are not lost due to a lack of follow-up EPS data, these results are for a larger sample of firms. Analysts' forecasts for EPS growth were higher for this larger sample of firms, with a more pronounced run-up and then decline around the stock market peak in 2000. The average projected growth rate hovered in the 14.5%-17.5% range until 1995 and then increased dramatically over the next five years to 23.3% in the fourth quarter of the year 2000. Forecasted EPS growth has since declined to the 15.0% range.

***Q82. WHAT IMPACT HAVE RECENT REGULATORY DEVELOPMENTS HAD ON ANALYSTS' EPS GROWTH RATE FORECASTS?***

*A82.* Analysts' EPS growth rate forecasts have subsided somewhat since the stock market peak of 2000. In addition, the apparent conflict of interest within

investment firms with investment banking and analysts' operations was addressed in the Global Analysts Research Settlements ("GARS"). GARS, as agreed upon on April 23, 2003, between the SEC, NASD, NYSE and ten of the largest U.S. investment firms, includes a number of regulations that were introduced to prevent investment bankers from pressuring analysts to provide favorable projections. Nonetheless, despite the new regulations, analysts' EPS growth rate forecasts have not significantly changed and continue to be overly-optimistic. Analysts' long-term EPS growth rate forecasts before and after GARS, are about two times the level of historic GDP growth. Furthermore, historic growth in GDP and corporate earnings has been in the 7% range.

Finally, these observations are supported by a *Wall Street Journal* article entitled "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation." The following quote provides insight into the continuing bias in analysts' forecasts:

> Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. "You would have thought that, given what happened in the last three years, people would have given up the ghost. But in large measure they have not."

> These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their

firms' investment-banking relationships, a lot of things haven't changed: Research remains rosy and many believe it always will.[26]

***Q83. IS THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS GENERALLY KNOWN IN THE MARKETS?***

*A83.* Yes. Page 3 of Exhibit JRW-13 provides a recent article published in the *Wall Street Journal* that discusses the upward bias in analysts' EPS growth rate forecasts.

***Q84. ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE UPWARDLY BIASED FOR ELECTRIC UTILITY COMPANIES?***

*A84.* Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for electric utility companies, I conducted a study similar to the one described above using a group of electric utility companies. The results are shown in Panel C of Exhibit JRW-13. The projected EPS growth rates have declined from about six percent in the 1990s to about five percent in the 2000s. As shown, the achieved EPS growth rates have been volatile. Overall, the upward bias in EPS growth rate projections is not as pronounced for electric utility companies as it is for all companies. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 4.59% and 2.90%, respectively. These results are consistent with the results for companies in general -- analysts' projected EPS growth rate forecasts are upwardly-biased for utility companies.

[26] Ken Brown, "Analysts Still Coming Up Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation." *Wall Street Journal*, (January 27, 2003), p. C1.

***Q85. ARE VALUE LINE'S GROWTH RATE FORECASTS SIMILARILY UPWARDLY BIASED?***

*A85.* Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as well. To assess *Value Line*'s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in Panel A of Exhibit JRW-14. I initially filtered the database and found that *Value Line* has 3-5 year EPS growth rate forecasts for 2,453 firms. The average projected EPS growth rate was 14.6%. This is high given that the average historical EPS growth rate in the U.S. is about 7%. A major factor seems to be that *Value Line* only predicts negative EPS growth for 47 companies. This is less than two percent of the companies covered by *Value Line*. Given the ups and downs of corporate earnings, this is unreasonable.

To put this figure in perspective, I screened the *Value Line* companies to see what percent of companies covered by *Value Line* had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 2,371 companies. The results are shown in Panel B of Exhibit JRW-14 and indicate that the average 5-year historic growth rate was 12.9%, and *Value Line* reported negative historic growth for 476 firms which represents 20.1% of these companies. It should be noted that the past five years have been a period of rapidly rising corporate earnings growth as the economy and businesses have rebounded from the recession of 2001.

These results indicate that *Value Line*'s EPS forecasts are excessive and unrealistic. It appears that the analysts at *Value Line* are similar to their Wall Street brethren in that they are reluctant to forecast negative earnings growth.

***Q86. PLEASE REVIEW YOUR ASSESSMENT OF DR. MAKHOLM'S DCF GROWTH RATE.***

*A86.* Dr. Makholm's DCF growth rate of 6.41% (Exhibit JDM-12) is excessive since he used an improper measure of sustainable growth and the overly optimistic projected EPS growth rates from Wall Street analysts and *Value Line*. He has totally ignored historic growth as well as other DCF indicators of growth such as DPS and BVPS.

**E. Selling and Issuance Costs**

***Q87. PLEASE ADDRESS DR. MAKHOLM'S DCF ADJUSTMENT FOR SELLING AND ISSSUANCE COSTS.***

*A87.* Dr. Makholm's had adjusted his DCF results for selling and issuance costs based on a flotation cost of 4.88% (Exhibit JDM-14). Selling and issuance costs, more commonly referred to as flotation costs, are incurred when a company sells securities to investors. Dr. Makholm has not identified any such costs for Dayton. Nonetheless, he still insists on adding 22 basis points (0.22%) to his DCF results for flotation costs. There is no need for such an adjustment. Usually it is argued that a flotation cost adjustment is necessary to prevent the dilution of the existing shareholders. Such an adjustment is commonly justified by reference to bonds and

the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for electric utility companies are in excess of 1.25 suggests that there should be a flotation cost reduction (and not increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of electric utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

(2) It is commonly argued that a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment. However, the reduction of the book value of stockholder investment associated with flotation costs can occur only when a company's stock is selling at a market price at/or below its book value. As noted above, electric utility companies are

selling at market prices well in excess of book value. Hence, when new shares are sold, existing shareholders realize an increase in the book value per share of their investment, not a decrease;

(3) Flotation costs consist primarily of the underwriting spread or fee and not out-of-pocket expenses. On a per share basis, the underwriting spread is the difference between the price the investment banker receives from investors and the price the investment banker pays to the company. Hence, these are not expenses that must be recovered through the regulatory process. Furthermore, the underwriting spread is known to the investors who are buying the new issue of stock, who are well aware of the difference between the price they are paying to buy the stock and the price that the Company is receiving. The offering price which they pay is what matters when investors decide to buy a stock based on its expected return and risk prospects. Therefore, the company is not entitled to an adjustment to the allowed return to account for those costs; and

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas Dr. Makholm believes that the Company should be compensated for these transactions costs by using the high-end DCF results, neither he nor I have accounted for other market transaction costs in determining a

cost of equity for the Company. Most notably, brokerage fees that investors pay when they buy shares in the open market are another market transaction cost. Brokerage fees increase the effective stock price paid by investors to buy shares. If Dr. Makholm and I had included these brokerage fees or transaction costs in our DCF analyses, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. To be fair then, if Dr. Makholm is to make an upward adjustment for transaction costs in the form of using the high-end DCF results, he also should have made a downward adjustment to his DCF results for transaction costs in the form of brokerage fees.

***Q88. PLEASE SUMMARIZE YOUR ASSESSMENT OF DR. MAKHOLM'S DCF ANALYSIS.***

*A88.* Dr. Makholm's DCF equity cost rate is overstated because he has: (1) employed an inappropriate group of comparable companies; (2) made an excessive adjustment to the dividend yield and used the upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line* in his DCF approach; and (3) made an unreasonable 0.22% adjustment to his DCF equity cost rate estimates to account for undocumented selling and issuance costs.

**F. CAPM Analysis**

***Q89. PLEASE DISCUSS DR. MAKHOLM'S CAPM.***

***A89.*** On pages 29-31 and in Exhibits JDM-15 – JDM-16, Dr. Makholm applies the CAPM to his comparison group of companies. His CAPM results are summarized in Panel B of Exhibit JRW-12. He uses a risk-free rate of 4.65% and betas from *Value Line*. He computes two different CAPM equity cost rates using (1) a historical equity risk premium and (2) a projected equity risk premium. His historical equity risk premium of 6.42% is the difference between the arithmetic mean stock and bond returns over the 1926-2006 historic time period as reported by Ibbotson Associates. He derives his projected equity risk premium of 9.49% by applying the DCF model to the S&P 500.

***Q90. PLEASE REVIEW THE ERRORS IN DR. MAKHOLM'S CAPM ANALYSES.***

***A90.*** There are two major errors. First, Dr. Makholm's risk-free rate of 4.65% is significantly above current long-term market interest rates. Secondly, and most significantly, the primary error with Dr. Makholm's CAPM results is that both the Ibbotson historic returns and Dr. Makholm's projected market returns are overstated as measures of expected equity risk premiums. This equity risk premium issue is addressed in depth below.

***Q91. PLEASE ADDRESS DR. MAKHOLM'S CAPM ANALYSIS THAT USES HISTORICAL STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR EX ANTE EQUITY RISK PREMIUM.***

***A91.*** Using the historical relationship between stock and bond returns to measure an ex ante equity risk premium is erroneous and overstates the true market equity risk

premium. The equity risk premium is based on expectations of the future and when past market conditions vary significantly from the present, historic data does not provide a realistic or accurate barometer of expectations of the future. Using historical returns to measure the ex ante equity risk premium ignores current market conditions and masks the dramatic change in the risk and return relationship between stocks and bonds. This change suggests that the equity risk premium has declined.

***Q92. PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.***

*A92.* There are a number of flaws in using historic returns over long time periods to estimate expected equity risk premiums. These issues include:

(A) Biased historical bond returns;

(B) The arithmetic versus the geometric mean return;

(C) The large error in measuring the equity risk premium using historical returns;

(D) Biased historical stock returns and transactions costs;

(E) Company survivorship bias;

(F) The "Peso Problem" - U.S. stock market survivorship bias;

(G) Market conditions today are significantly different than the past; and

(H) Changes in risk and return in the markets.

These issues will be addressed in order.

## G. Biased Historical Bond Returns

***Q93. HOW ARE HISTORICAL BOND RETURNS BIASED?***

*A93.* An essential assumption of these studies is that over long periods of time investors' expectations are realized. However, the experienced returns of bondholders in the past violate this critical assumption. Historic bond returns are biased downward as a measure of expectancy because of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data are biased upwards.

## H. The Arithmetic versus the Geometric Mean Return

***Q94. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON METHODOLOGY.***

*A94.* The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (i.e., a time series), the best measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following observation: "The geometric mean measures the changes in wealth over more than one period

on a buy and hold (with dividends invested) strategy."[27] Since Dr. Makholm's study covers more than one period (and he assumes that dividends are reinvested), he should be employing the geometric mean and not the arithmetic mean.

***Q95. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH USING THE ARITHMETIC MEAN RETURN.***

*A95.* To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that is selling for $100 today, increases to $200 in one year, and then falls back to $100 in two years. The table below shows the prices and returns.

| Time Period | Stock Price | Annual Return |
|---|---|---|
| 0 | $100 | |
| 1 | $200 | 100% |
| 2 | $100 | -50% |

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using

[27] Willard T. Carleton and Josef Lakonishok, "Risk and Return on Equity: The Use and Misuse of Historical Estimates," *Financial Analysts Journal* (January-February, 1985), pp. 38-47.

the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the U.S. Securities and Exchange Commission requires equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[28] Therefore, Dr. Makholm's arithmetic mean return measures are upwardly biased and should be disregarded.

## I. The Large Error in Measuring Equity Risk Premiums with Historic Data

***Q96. PLEASE DISCUSS THE LARGE ERROR IN MEASURING THE EQUITY RISK PREMIUM USING HISTORICAL STOCK AND BOND RETURNS.***

*A96.* Measuring the equity risk premium using historical stock and bond returns is subject to a very large amount of forecasting error. For example, the long-term equity risk premium of 6.5% has a standard deviation of 20.6%. This may be interpreted in the following way with respect to the historical distribution of the long-term equity risk premium using a standard normal distribution and a 95% +/- two standard deviation confidence interval: We can say, with a 95% degree of confidence, that the true equity risk premium is between -34.7% and +47.7%. As such, the historical equity risk premium is measured with a large degree of error.

[28] U.S. Securities and Exchange Commission, Form N-1A.

## J. Biased Historic Stock Returns and Transaction Costs

***Q97. YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE IBBOTSON METHODOLOGY. PLEASE ELABORATE.***

*A97.* Returns developed using Ibbotson's methodology are computed on stock indexes and, therefore (1) cannot be reflective of expectations because these returns are unattainable to investors and (2) produce biased results. This methodology assumes: (a) monthly portfolio rebalancing and (b) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors rebalance their portfolios at the end of each month in order to have an equal dollar amount invested in each security at the beginning of each month. The assumption would obviously generate extremely high transaction costs and thereby render these returns unattainable to investors. In addition an academic study demonstrates that the monthly portfolio rebalancing assumption produces biased estimates of stock returns.[29]

Transaction costs themselves provide another bias in historic versus expected returns. The observed stock returns of the past were not the realized returns of investors due to the much higher transaction costs of previous decades. These higher transaction costs are reflected through the higher commissions on stock trades and the lack of low cost mutual funds like index funds. Jeremy Siegel estimates that the transactions costs associated with replicating a market portfolio with reinvested dividends would subtract 100-200 basis points from the stock

[29] See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics* (1983), pp. 371-86.

holder returns. In other words, the actual realized equity returns were probably 100-200 basis points below those calculated from historic data.[30]

## K. Company Survivorship Bias

***Q98. HOW DOES COMPANY SURVIVORSHIP BIAS AFFECT DR. MAKHOLM'S HISTORIC EQUITY RISK PREMIUM?***

*A98.* Using historic data to estimate an equity risk premium suffers from company survivorship bias. Company survivorship bias results when using returns from indexes like the S&P 500. The S&P 500 includes only companies that have survived. The fact that returns of firms that did not perform so well were dropped from these indexes is not reflected. Therefore, these stock returns are upwardly biased because they only reflect the returns from more successful companies.

## L. The "Peso Problem" - U.S. Stock Market Survivorship Bias

***Q99. WHAT IS THE "PESO PROBLEM," AND HOW DOES IT RELATE TO SURVIVORSHIP BIAS IN U. S. STOCK MARKET RETURNS?***

*A99.* Dr. Makholm's use of historic return data also suffers from the so-called "Peso Problem," which is also known as U.S. stock market survivorship bias. The "Peso problem" was first highlighted by the Nobel laureate, Milton Friedman, and gets

[30]Jeremy J. Siegel, "Perspectives on the Equity Risk Premium," *Financial Analysts Journal* (November/December 2005), p. 65.

its name from conditions related to the Mexican peso market in the early 1970s. This issue involves the fact that past stock market returns were higher than were expected at the time because despite war, depression, and other social, political, and economic events, the U.S. economy survived and did not suffer hyperinflation, invasion, and/or the calamities of other countries. As such, highly improbable events, which may or may not occur in the future, are factored into stock prices, leading to seemingly low valuations. Higher than expected stock returns are then earned when these events do not subsequently occur. Therefore, the "Peso problem" indicates that historic stock returns are overstated as measures of expected returns because the U.S. markets have not experienced the disruptions of other major markets around the world.

**M. Market Conditions Today are Significantly Different than in the Past**

***Q100. FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS HOW MARKET CONDITIONS ARE DIFFERENT TODAY.***

***A100.*** The equity risk premium is based on expectations of the future. When past market conditions vary significantly from the present, historic data does not provide a realistic or accurate barometer of expectations of the future. As noted previously, stock valuations (as measured by P/E) are relatively high and interest rates are relatively low, on a historic basis. Therefore, given the high stock prices and low interest rates, expected returns are likely to be lower on a going forward basis.

## N. Changes in Risk and Return in the Markets

***Q101. PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK PREMIUM STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN TODAY'S FINANCIAL MARKETS.***

***A101.*** The historic equity risk premium methodology is unrealistic in that it makes the explicit assumption that risk premiums do not change over time based on market conditions such as inflation, interest rates, and expected economic growth. Furthermore, using historic returns to measure the equity risk premium masks the dramatic change in the risk and return relationship between stocks and bonds. The nature of the change, as I will discuss below, is that bonds have increased in risk relative to stocks. This change suggests that the equity risk premium has declined in recent years.

Page 1 of Exhibit JRW-15 provides the yields on long-term U.S. Treasury bonds from 1926 to 2007. One very obvious observation from this graph is that interest rates increased dramatically from the mid-1960s until the early 1980s and have since returned to their 1960 levels. The annual market risk premiums for the 1926 to 2007 period are provided on page 2 of Exhibit JRW-15. The annual market risk premium is defined as the return on common stock minus the return on long-term U.S. Treasury Bonds. There is considerable variability in this series and a clear decline in recent decades. The high was 54% in 1933, and the low was negative 38% in 1931. Evidence of a change in the relative riskiness of bonds and

stocks is provided on page 3 of Exhibit JRW-15, which plots the standard deviation of monthly stock and bond returns since 1930. The plot shows that, whereas stock returns were much more volatile than bond returns from the 1930s to the 1970s, bond returns became more variable than stock returns during the 1980s. In recent years, stocks and bonds have become much more similar in terms of volatility, but stocks are still a little more volatile. The decrease in the volatility of stocks relative to bonds over time has been attributed to several stock-related factors: (1) the impact of technology on productivity and the new economy; (2) the role of information on the economy and markets; (3) better cost and risk management by businesses; (4) several bond- related factors; (5) deregulation of the financial system; (6) inflation fears and interest rates; and (7) the increase in the use of debt financing. Further evidence of the greater relative riskiness of bonds is shown on page 4 of Exhibit JRW-15, which plots real interest rates (the nominal interest rate minus inflation) from 1926 to 2007. Real rates have been well above historic norms during the past 10-15 years. These high real interest rates reflect the fact that investors view bonds as riskier investments.

The net effect of the change in risk and return has been a significant decrease in the return premium that stock investors require over bond yields. In short, the equity or market risk premium has declined in recent years. This decline has been discovered in studies by leading academic scholars and investment firms, and has been acknowledged by government regulators. As such, using a historic equity risk

premium analysis is simply outdated and not reflective of current investor expectations and investment fundamentals.

***Q102. DO YOU HAVE ANY OTHER THOUGHTS ON THE USE OF HISTORICAL RETURN DATA TO ESTIMATE AN EQUITY RISK PREMIUM?***

*A102.* Yes. Jay Ritter, a Professor of Finance at the University of Florida, identified the use of historical stock and bond return data to estimate a forward-looking equity risk premium as one of the "Biggest Mistakes" taught by the finance profession.[31] His argument is based on the theory behind the equity risk premium, the excessive results produced by historical returns, and the previously-discussed errors such as survivorship bias in historical data.

***Q103. PLEASE REVIEW DR. MAKHOLM'S CAPM APPROACH USING A PROJECTED EQUITY RISK PREMIUM.***

*A103.* Dr. Makholm develops an expected market risk premium of 9.49% by: (1) applying the DCF model to the S&P 500 to get an expected market return; and (2) subtracting the risk-free rate of interest. Dr. Makholm's estimated market return of 14.14% for the S&P 500 equals the sum of the dividend yield of 2.27%, an expected EPS growth rate of 11.48%, and issuance cost of 0.13%. The expected EPS growth rate is the average of the expected EPS growth rates from First Call. The primary error in this approach is his expected DCF growth rate. As previously discussed, the expected EPS growth rates of Wall Street analysts are upwardly biased.

[31] Jay Ritter, "The Biggest Mistakes We Teach," *Journal of Financial Research* (Summer 2002).

Therefore, as explained below, this produces an overstated expected market return and equity risk premium.

***Q104. BEYOND YOUR PREVIOUS DISCUSSION OF THE UPWARD BIAS IN ANALYSTS' EPS GROWTH RATE FORECASTS, WHAT OTHER EVIDENCE CAN YOU PROVIDE THAT DR. MAKHOLM'S S&P 500 GROWTH RATE IS EXCESSIVE?***

***A104.*** A long-term EPS growth rate of 11.48% is inconsistent with economic and earnings growth in the U.S. The long-term economic and earnings growth rate in the U.S. has only been about 7%. I have performed a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-9, and a summary is given in the table below.

**GNP, S&P 500 Stock Price, EPS, and DPS Growth**
**1960-Present**

| | |
|---|---|
| Nominal GDP | 7.20% |
| S&P 500 Stock Price Appreciation | 7.12% |
| S&P 500 EPS | 7.36% |
| S&P 500 DPS | 5.77% |
| Average | 6.86% |

These results offer compelling evidence that a long-run growth rate of about 7% is appropriate for companies in the U.S. By comparison, Dr. Makholm's long-run growth rate projection of 11.48% is clearly not realistic. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by over 50% in the future and (2) maintain that growth indefinitely in an

economy that is expected to grow at about one half his projected growth rates. Such a scenario is not economically feasible or reasonable.

***Q105. PLEASE PROVIDE A SUMMARY ASSESSMENT OF DR. MAKHOLM'S EQUITY RISK PREMIUM OF 9.49% DERIVED USING AN EXPECTED MARKET RETURN OF 14.14%.***

*A105.* Dr. Makholm's equity risk premium derived from an expected market return of 14.14% is inflated and does not reflect current market fundamentals or prospective economic and earnings growth. As previously discussed, at the present time stock prices (relative to earnings and dividends) are high while interest rates are low. Major stock market upswings that produce above average returns tend to occur when stock prices are low and interest rates are high. Thus, current market conditions do not suggest above-average expected market return. Consistent with this observation, the financial forecasters in the Federal Reserve Bank of Philadelphia survey expect a market return of 6.80% over the next ten years. In addition, the *CFO Magazine*–Duke University Survey of over 500 CFOs shows an expected return on the S&P 500 of 8.30% over the next ten years.

***Q106. TO CONCLUDE THIS DISCUSSION, PLEASE SUMMARIZE DR. MAKHOLM'S MARKET RISK PREMIUM AND CAPM RESULTS IN LIGHT OF THE EVIDENCE ON RISK PREMIUMS IN TODAY'S MARKETS.***

*A106.* Dr. Makholm's market risk premium of 9.49% is well in excess of the equity risk premium estimates calculated in recent academic studies by leading finance

scholars and is especially out of touch with the real world of finance. Investment banks, consulting firms, and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions. On this issue, the opinions of CFOs are especially relevant. CFOs deal with capital markets on an ongoing basis since they must continually assess and evaluate capital costs for their companies. Furthermore, as is the case with any student of finance, they are well aware of the historical equity risk premium results as published by Ibbotson Associates as well as Wall Street analysts' projections. Exhibit JRW-17 shows the equity risk premium results from the *CFO Magazine*-Duke University survey on a quarterly basis from 2000 to 2008. The CFOs in the survey indicate that the appropriate equity risk premium at the present time is in the 4.0%-5.0% range and certainly not in the 9.0% range. As such, the appropriate equity cost rate for a public utility should be in the 9.0-10.0% range and not in the 11.0%-12.0% range.

## VIII. THE FINANCIAL PERFORMANCE OF DAYTON

***Q107. PLEASE DISCUSS YOUR FINANCIAL ANALYSIS OF THE PERFORMANCE OF DAYTON.***

*A107.* In Exhibit JRW-18 I have provided the results of my financial analysis of Dayton Power & Light over the past five years. On page 1, I provide capitalization and financial statistics for the Company. The capitalization data show that Dayton has consistently had a common equity ratio of about 60%. For example, according to *Value Line*, the average common equity ratio for electric utilities located in the

central U.S. is approximately 46%. Dayton's financial statistics suggest strong, consistent performance over the past five years, with positive trends. Its profit margin has consistently been in the high teens and the pre-tax interest coverage for the Company has nearly doubled to 17.2X. Dayton's return on average common equity has consistently been in the 20.0% area over the past five years. This compares to an average return on common equity in the 11.0%-12.0% range for electric utilities located in the central U.S.

Page 2 of Exhibit JRW-18 provides graphs of some key financial performance indicators including total assets, net plant, revenues, earnings on common stock, and return on average common equity. These graphs support the observations made from the capitalization and financial statistics for the Company. Dayton Power & Light has exhibited strong, consistent performance over the past five years, with positive trends.

## IX. CARRYING CHARGE ON DEFERRALS

***Q108. DO YOU HAVE A POSITION ON THE COMPANY'S PROPOSED FUEL COST DEFERRAL ACCOUNT?***

***A108.*** No. This issue is addressed by OCC Witness Duann in his testimony.

***Q109. WHAT IS THE COMPANY'S PROPOSED CARRYING CHARGE FOR THE FUEL COST DEFERRAL ACCOUNT?***

***A109.*** The Company has proposed to defer carrying costs on the fuel cost deferral in

account 182.3, Other Regulatory Assets. As a carrying charge for the fuel cost deferral, Dayton has asked the Commission for authorization to use its proposed overall rate of return grossed up for deferred income taxes.[32] This corresponds to a carrying charge of 13.32%.

***Q110. DO YOU AGREE THAT THIS IS THE APPROPRIATE CARRYING CHARGE FOR THE FUEL COST DEFERRAL ACCOUNT?***

*A110.* No. First of all, elsewhere in my testimony I have addressed the errors in Dr. Makholm's proposed overall rate of return. In particular, I have shown that Dr. Makholm's recommended rate of return is excessive primarily due to an inappropriate capital structure and an overstated equity cost rate. Second, and more importantly, I do not believe that the overall rate of return grossed up for deferred income taxes is the appropriate carrying cost rate for the fuel deferrals. The fuel cost deferral account is not a capital investment and consequently it should not earn a rate of return comparable to that of a capital investment. In addition, the risk to Dayton of non-recovery of its fuel cost deferral is minimal once the prudence of the expenditure has been determined by the Commission. Therefore, the risk is much less for fuel cost deferral than that associated with any type of capital investments.

***Q111. IS THE COMPANY'S PROPOSED CARRYING CHARGE CONSISTENT WITH THE COMMISSION'S POLICY?***

[32] Campbell direct testimony at page 5.

*A111.* No. I believe the Company's proposal of using overall cost of capital as the carrying cost for fuel cost deferral is contrary to the Commission decisions. In a proceeding seeking authority to defer a portion of the utilities' Operation and Maintenance expenses in the aftermath of a wind storm,[33] the Commission specifically rejected a carrying cost calculation that contains an equity component, and directed that on a going forward basis, Columbus Southern Power ("CSP") and Ohio Power Company ("OPC") utilize the interest rate that reflects the Companies' actual cost of debt previously authorized when calculating carrying costs on all deferred amounts. In an earlier decision related to the Transmission Cost Recovery Rider, the Commission made a similar determination. It rejected the request of CSP and OPC to set the carrying charges based on the overall rate of return (including a return on equity and a gross up of income tax) and required the utilities to use actual cost of debt when calculating carrying costs.[34]

***Q112. IN YOUR OPINION, WHAT IS THE APPROPRIATE CARRYING CHARGE FOR ANY FUEL COST DEFERRAL?***

*A112.* I believe the proper carrying charge for the balance in the fuel cost deferral account should be the Company's cost of long-term debt of 5.86% and not its overall cost of capital. As noted above, the fuel cost deferral account is not a capital investment. Instead, the deferral of fuel cost is essentially a "loan" made

[33] Case No. 08-1301-EL-AAM, Commission Finding and Order, December 19, 2008.

[34] Case No. 08-1202-EL-UNC, Commission Finding and Order, December 17, 2008.

by Dayton to its customers to cover a portion of the fuel cost not currently collected. As proposed, the deferrals will accumulate in a regulatory asset account beginning in 2009, and each year hence the dollar amounts included in the account will include fuel deferrals plus the carrying charge and minus customer charges. As proposed, the dollar amount in the fuel cost deferral account peaks in 2011, and then decreases annually due to annual customer charges and zeroes out in 2020. As such, the fuel cost deferral account has the characteristics of a self- amortizing loan, much like a home mortgage. In my opinion, the appropriate carrying charge for the fuel cost deferral account is the Company's long-term debt cost rate.

## X. CONCLUSION

***Q113. DOES THIS CONCLUDE YOUR TESTIMONY?***

*A113.* Yes.

## CERTIFICATE OF SERVICE

It is hereby certified that a true copy of the foregoing the *Direct Testimony of J. Randall Woolridge, Ph.D on Behalf of the Office of the Ohio Consumers' Counsel* has been served via electronic transmission this 26th day of January, 2009.

Jacqueline Lake Roberts,
Assistant Consumers' Counsel

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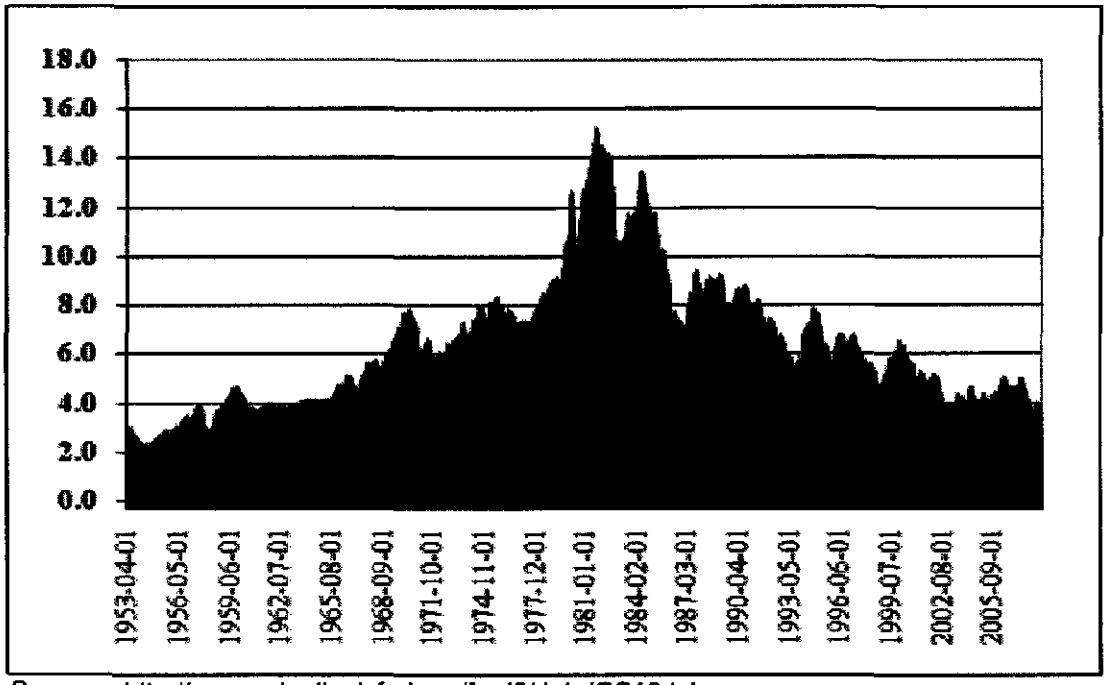
# Exhibit JRW-1

## Dayton Power and Light Company
## Cost of Capital

**Dayton Power and Light Company**
**Weighted Average Cost of Capital**

| Capital Source | Capitalization Ratio | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| Long-Term Debt | 54.00% | 5.59% | 3.02% |
| Preferred Stock | 0.50% | 3.93% | 0.02% |
| Common Equity | 45.50% | 9.75% | 4.44% |
| Total Capital | 100.00% | | 7.47% |

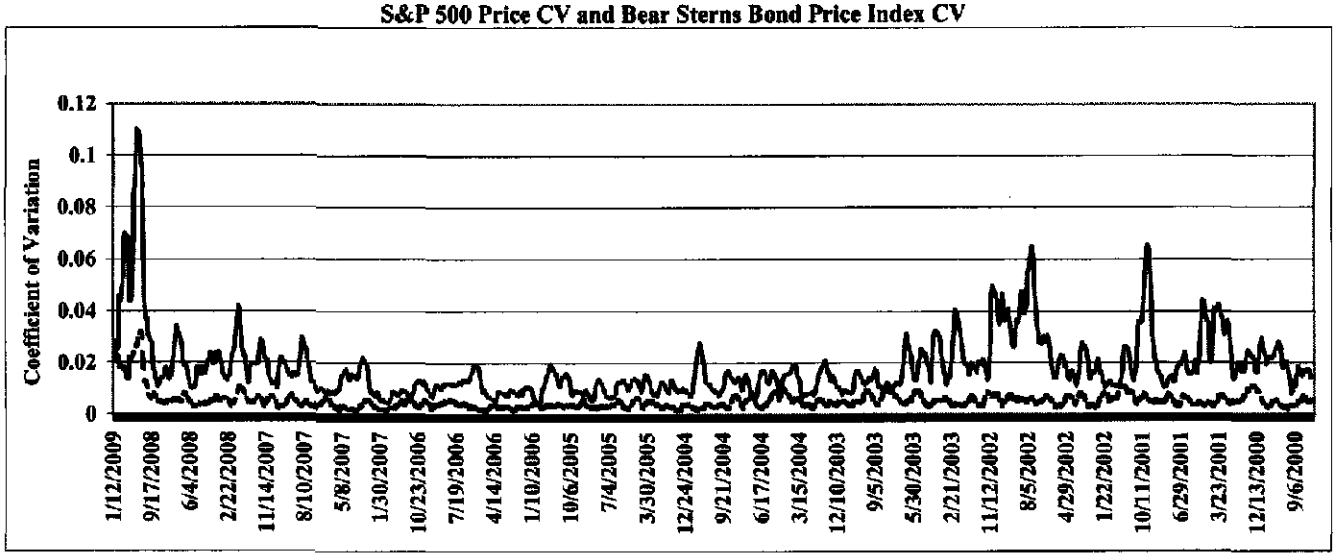
**Exhibit JRW-2**
**Ten-Year Treasury Yields**
**1953-Present**



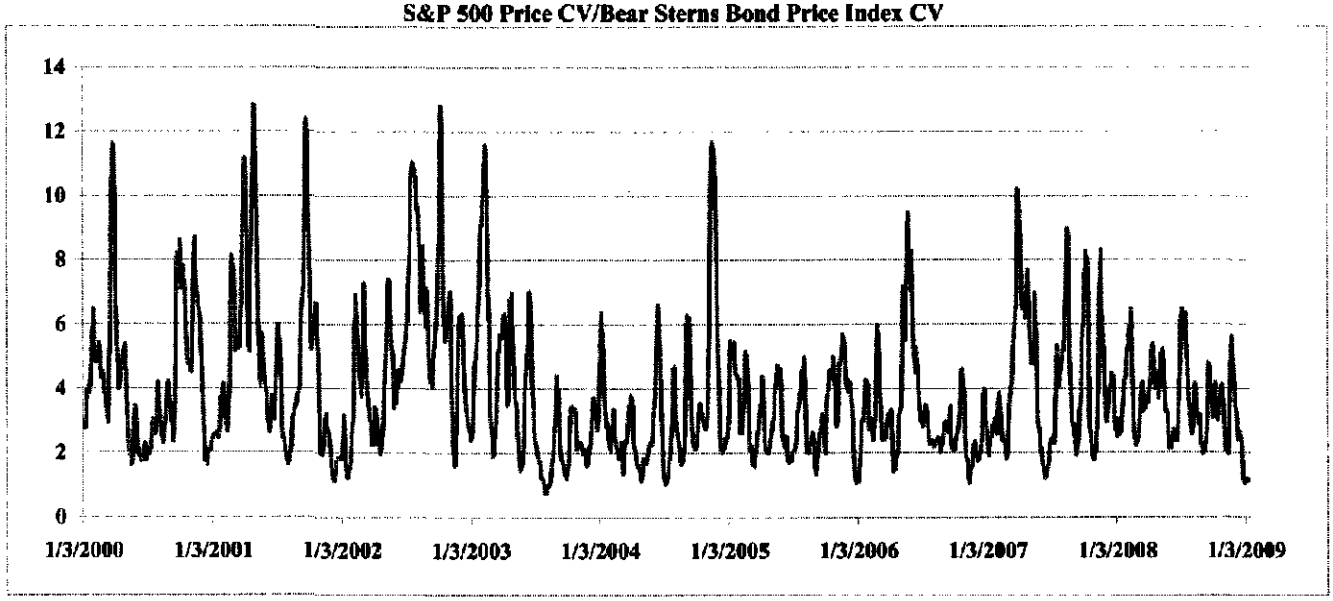

Source: http://research.stlouisfed.org/fred2/data/GS10.txt

**Exhibit JRW-3**

**Panel A**
**Coefficient of Variation**
**S&P 500 Price CV and Bear Sterns Bond Price Index CV**




**Panel B**
**Coefficient of Variation**
**S&P 500 Price CV/Bear Sterns Bond Price Index CV**




**Data Source: Bloomberg**

Exhibit JRW-3
Bonds a Bright Spot for Utilities in '08

THE WALL STREET JOURNAL.

JANUARY 12, 2009

## Bonds a Bright Spot for Utilities in '08

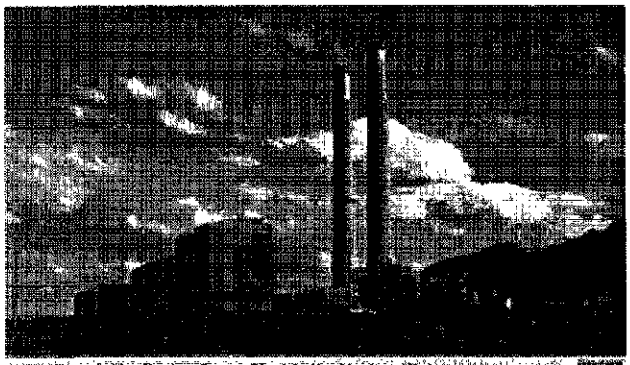
### Debt Issuance Rose 34% as Investors Shunned Commercial Paper, Stocks

By REBECCA SMITH

Even as credit markets seized last year, the utility industry achieved a noteworthy feat: It sold more bonds than it had in years.

Utilities with investment-grade credit ratings sold $47 billion of corporate bonds last year, 34% more than the $35 billion issued in 2007 and 77% more than the $26.5 billion of 2006.

The 2008 increase marked one of the few bright spots in the overall bond market, which registered a decline in issuance of nearly 35%, to $645 billion from $987 billion in 2007, according to Thomson SDC.



PacifiCorp's Huntington Power Plant in Huntington, Utah

**Some of Heftiest Utility Bond Sales**

2008 sales rose. So did spreads.

| Date priced | Company | Total size (billions) | Interest rate | Spread to U.S. Treasurys* (pct. pts) |
|---|---|---|---|---|
| Sept. 8, '08 | Oncor Electric Delivery | $1.5 | 5.950% | 3.08 |
| June 11, '08 | Florida Power | 1.5 | 5.650 | 1.63 |
| April 1, '08 | Consolidated Edison of N.Y. | 1.2 | 5.850 | 2.30 |
| Jan. 5, '09 | PacifiCorp | 1.0 | 5.500 | 3.10 |
| Nov. 12, '08 | Duke Energy Carolinas | 0.9 | 5.750 | 3.45 |
| Nov. 17, '08 | Sempra Energy | 0.75 | 8.900 | 6.70 |
| Nov. 4, '08 | Virginia Electric & Power | 0.7 | 8.875 | 4.56 |
| May 15, '08 | NiSource Finance | 0.7 | 6.150 | 2.92 |
| March 19, '08 | Commonwealth Edison | 0.7 | 5.800 | 2.45 |
| March 25, '08 | MidAmerican Energy | 0.65 | 5.750 | 2.25 |

Source: Thomson SDC

*Based on first portion of issuance

Utilities are the third-largest debt issuers after government and finance, requiring a steady supply of cash to build power plants, pipelines and transmission lines and to meet tightening environmental requirements. When credit markets tanked last autumn, many utilities were hurt as market valuations tumbled amid investor fears that demand for their services would decline and that they would have difficulty raising the large sums of money they require, at least at affordable rates.

The full-year issuance for utilities is encouraging, analysts said, because it shows a vital sector of the economy has adapted to changing conditions and is getting the money it needs to support basic operations as well as fund expansion.

Utilities will be critical players in President-elect Barack Obama's economic-stimulus plan, particularly in efforts to modernize the nation's electric grid and to triple the amount of energy garnered from renewable sources in coming years.

## Exhibit JRW-3
## Bonds a Bright Spot for Utilities in '08

Key to that effort is the ability of utilities to finance big infrastructure projects. Steve Tulip, a managing director in debt capital markets for Goldman Sachs Group, says utilities stood out in a stormy credit landscape. "The flight to quality clearly has benefited the power sector," Mr. Tulip said. "Investors are looking for safe havens."

Utilities leaned on the bond market last year partly out of desperation because commercial paper markets came unglued and they were unable, in some cases, to refinance short-term notes. Meantime, sagging stock market valuations made equity issuance unattractive. Bonds offered a better way for companies to secure stable money and garner some measure of protection against what could be a rough 2009.

"We expect a choppy economy," said Bill Johnson, chief executive of Progress Energy Inc., a utility that operates in the Carolinas and Florida that sold $600 million of bonds Jan. 8. It hopes that will be sufficient to tide it over until 2010. "It felt good to get that one off the table," he said.

The 10-year bonds carried a coupon rate of 5.3%, substantially less than the 7.5% to 8% rate executives felt they might have to swallow, based on prevailing rates in mid- to late-December.

"People have turned the page on 2008 and spreads have come down for people like us," said Mark Mulhern, Progress Energy's chief financial officer.

Pepco Holdings Inc. did three $250-million bond issuances in November and December for its three utilities, including sales of five-year, 10-year and 30-year bonds. Though the spreads to comparable U.S. Treasurys were high -- such as the 4.12 percentage point spread for 10-year bonds issued by Atlantic City Electric -- the actual coupon rates "weren't bad," said Chief Financial Officer Paul Barry. Interest rates were 7.75% for the Atlantic City Electric issuance and 6.4% and 6.5% on two other issues.

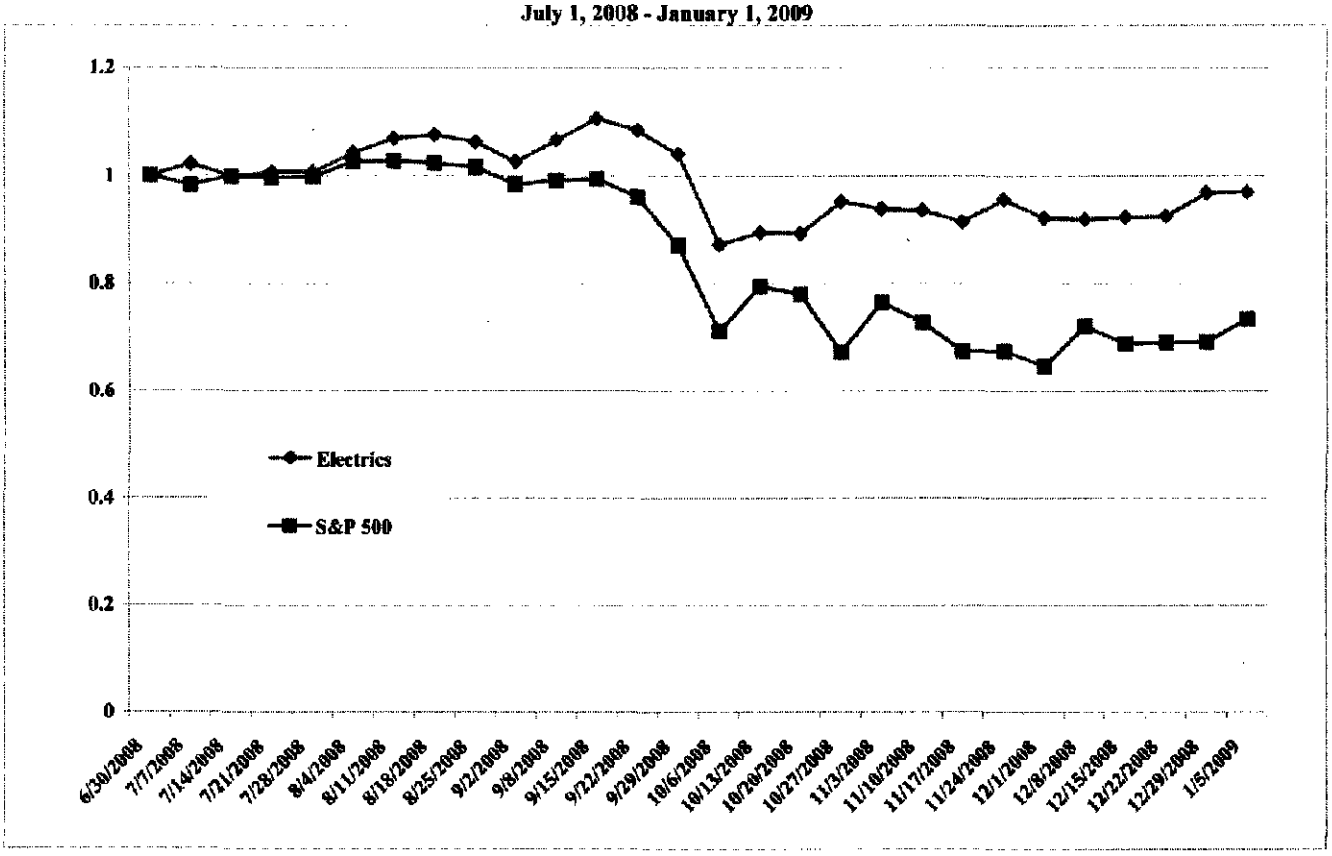
Higher financing costs for utilities could put pressure on customer rates if they continue long enough. That is because financing costs typically are a pass-through expense, though there sometimes is a lag between when costs are incurred and when they get folded into rates. That lag can be a drag on utility earnings.

The financing cost, expressed as a "spread," or an amount above the interest rates for U.S. Treasury notes of similar duration, widened to about five to eight percentage points by the end of 2008 from two or three percentage points at the beginning of the year. The actual interest rates paid to bond purchasers, called the coupon rates, didn't rise to unbearable levels because Treasury interest rates fell.

In the fourth quarter, issuance by investment-grade utilities topped $10 billion. In 2008, utilities widened their share of total U.S. investment-grade bond issuance to 7% from 4% in 2007 and 3% in 2006.

Total bond issuance by financial firms, such as commercial banks and investment banks, skidded 52% to $322 billion from $676 billion in 2007 and $686 billion in 2006. For nonfinancial firms, with utilities excluded, total issuance held steady at $275 billion for 2008 and 2007, up from $217 billion in 2006.

**Exhibit JRW-3**
**The Performance of Electric Utility Stocks Relative to the S&P 500**
**July 1, 2008 - January 1, 2009**




**Data Source: www.yahoo.com**

# Exhibit JRW-4
## Dayton Power and Light Company
### Summary Financial Statistics for Electric Proxy Group

**Electric Proxy Group**

| Company | Operating Revenue ($mil) | Percent Elec Revenue | Net Plant ($mil) | Moody's Bond Rating | S&P Bond Rating | Long-Term Interest Coverage | Primary Service Area | Common Equity Ratio | Return on Equity | Market to Book Ratio |
|---|---|---|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 817.2 | 88 | 1,292.4 | NR | A- | 6.0 | MN, WS | 58 | 12.6 | 1.28 |
| Ameren Corporation (NYSE-AEE) | 7,734.0 | 82 | 15,977.0 | Baa2 | BBB | 4.1 | IL, MO | 47 | 9.5 | 0.98 |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 345.3 | 100 | 333.2 | NR | BBB+ | 4.1 | VT | 50 | 8.1 | 1.10 |
| Cleco Corporation (NYSE-CNL) | 1,074.7 | 95 | 1,982.0 | Baa1 | BBB | 3.2 | LA | 50 | 10.0 | 1.23 |
| DPL Inc.(NYSE-DPL) | 1,580.3 | 100 | 2,850.4 | A2 | A- | 6.2 | OH | 40 | NM | 2.54 |
| Empire District Electric Co. (NYSE-EDE) | 502.0 | 87 | 1,300.5 | Baa1 | BBB+ | 1.9 | MO,KS,OK,AR | 42 | 6.2 | 1.03 |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 3,127.3 | 85 | 2,518.4 | Baa2 | BBB | 2.7 | HI | 38 | 9.5 | 1.42 |
| IDACORP, Inc. (NYSE-IDA) | 940.8 | 100 | 2,717.2 | A3 | A- | 2.4 | ID,OR | 46 | 8.2 | 1.04 |
| Northeast Utilities (NYSE-NU) | 5,627.0 | 84 | 7,941.0 | Baa1 | BBB+ | 2.8 | CT,NH,MA | 39 | 8.9 | 1.17 |
| NSTAR (NYSE-NST) | 3,278.9 | 79 | 4,310.3 | A1 | AA- | 3.3 | MA | 40 | 5.2 | 2.12 |
| Pinnacle West Capital Corp. (NYSE-PNW) | 3,502.0 | 89 | 8,650.5 | Baa2 | BBB- | 3.2 | AZ | 50 | 7.3 | 0.85 |
| Progress Energy Inc. (NYSE-PGN) | 8,319.0 | 100 | 17,915.0 | A2 | A- | 2.9 | NC,SC,FL | 44 | 7.9 | 1.16 |
| UIL Holdings Corporation (NYSE-UIL) | 952.3 | 100 | 1,008.6 | Baa2 | NR | 4.2 | CT | 40 | 10.0 | 1.60 |
| Mean | 2,907.8 | 91 | 5,292.0 | Baa1 | | 3.6 | | 45 | 8.6 | 1.35 |

Data Source: AUS *Utility Reports*, January, 2009; Service Area and Long-Term Interest Coverage are from *Value Line Investment Survey*, 2008.

**Exhibit JRW-5**
**Dayton Power and Light Company**
**Capital Structure Ratios**

**Panel A - Dayton's Recommended Capitalization Ratios**

| Capital | Capitalization Amounts | Capitalization Ratios |
|---|---|---|
| Debt | 759,404,859 | 34.35% |
| Preferred Stock | 20,755,037.00 | 0.94% |
| Common Equity* | 1,430,469,308 | 64.71% |
| Total Capital* | 2,210,706,204 | 100.00% |

Source: Testimony of Dr. Makholm

**Panel B - Dayton's Average Capitalization Ratios - 2005-2007**

| | 2005 | 2006 | 2007 | Average |
|---|---|---|---|---|
| Debt | 38.36% | 38.50% | 39.16% | 38.67% |
| Preferred Stock | 1.28% | 1.12% | 1.00% | 1.13% |
| Common Equity | 60.36% | 60.37% | 59.84% | 60.19% |
| Total* | 100.00% | 100.00% | 100.00% | 100.00% |

Source: Company Financial Statements

**Panel C - Average Common Equity Ratio of Electric Proxy Group - 2008**

| | 2008 |
|---|---|
| Average Common Equity Ratio | 45.7 |

Source: Page 2 of Exhibit JRW-5

**Panel D - Electric Proxy Group Average Quarterly Capital Structures**

| Source | 30-Sep-08 | 30-Jun-08 | 31-Mar-08 | 31-Dec-07 |
|---|---|---|---|---|
| Long-Term Debt | 51.68% | 53.41% | 51.75% | 51.68% |
| Preferred Stock | 0.44% | 0.49% | 0.51% | 0.52% |
| Common Equity | 47.88% | 46.10% | 47.74% | 47.81% |
| Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |

Source: Page 3 of Exhibit JRW-5

**Panel E - Electric Proxy Group Average Capital Structure**

| Source | Ratio |
|---|---|
| Long-Term Debt | 52.13% |
| Preferred Stock | 0.49% |
| Common Equity | 47.38% |
| Total Capital | 100.00% |

Source: Page 3 of Exhibit JRW-5

**Panel F - DPL Inc.'s Capital Structure - 9/30/2008**

| Source | Ratio |
|---|---|
| Long-Term Debt | 57.50% |
| Preferred Stock | 1.03% |
| Common Equity | 41.47% |
| Total Capital | 100.00% |

Source: Page 3 of Exhibit JRW-5

**Panel G - DPL Inc.'s 2009 Capital Structure**

| Source | Ratio |
|---|---|
| Long-Term Debt | 54.00% |
| Preferred Stock | 0.50% |
| Common Equity | 45.50% |
| Total Capital | 100.00% |

Source: *Value Line Investmetn Survey*, December 26, 2008

*Exhibit* JRW-5
Dayton Power and Light Company
Common Equity Ratios of Electric Proxy Group

Electric Proxy Group

| Company | Jan | Feb | Mar | Apr | May | June | July | Aug | Sep | Oct | Nov | Dec | Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 62.0 | 62.0 | 63.0 | 63.0 | 63.0 | 60.0 | 60.0 | 60.0 | 60.0 | 57.0 | 57 | 58 | **60.4** |
| Ameren Corporation (NYSE-AEE) | 49.0 | 49.0 | 49.0 | 47.0 | 47.0 | 47.0 | 47.0 | 47.0 | 46.0 | 46.0 | 46 | 47 | **47.2** |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 59.0 | 59.0 | 59.0 | 60.0 | 60.0 | 51.0 | 51.0 | 51.0 | 50.0 | 50.0 | 50 | 50 | **54.2** |
| Cleco Corporation (NYSE-CNL) | 56.0 | 56.0 | 56.0 | 54.0 | 54.0 | 51.0 | 51.0 | 51.0 | 49.0 | 49.0 | 49 | 50 | **52.2** |
| DPL Inc.(NYSE-DPL) | 34.0 | 34.0 | 34.0 | 35.0 | 35.0 | 35.0 | 36.0 | 36.0 | 36.0 | 39.0 | 39 | 40 | **36.1** |
| Empire District Electric Co. (NYSE-EDE) | 45.0 | 45.0 | 45.0 | 48.0 | 48.0 | 45.0 | 45.0 | 45.0 | 45.0 | 44.0 | 44 | 42 | **45.1** |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 27.0 | 27.0 | 27.0 | 27.0 | 27.0 | 29.0 | 29.0 | 29.0 | 29.0 | 38.0 | 38 | 38 | **30.4** |
| IDACORP, Inc. (NYSE-IDA) | 48.0 | 48.0 | 48.0 | 47.0 | 47.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46.0 | 46 | 46 | **46.7** |

**Dayton Power and Light Company**
**Capital Structures of Electric Proxy Group**

| | | 30-Sep-08 | 30-Jun-08 | 31-Mar-08 | 31-Dec-07 | | 30-Sep-08 | 30-Jun-08 | 31-Mar-08 | 31-Dec-07 |
|---|---|---|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (N' | L-T Debt | 537,200 | 538,500 | 470,300 | 410,900 | L-T Debt | 40.18% | 41.50% | 38.50% | 35.62% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 799,700 | 759,200 | 751,400 | 742,600 | Common Equity | 59.82% | 58.50% | 61.50% | 64.38% |
| | Total Capital | 1,336,900 | 1,297,700 | 1,221,700 | 1,153,500 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Ameren Corporat | L-T Debt | 6,143,000 | 6,146,000 | 5,066,000 | 5,692,000 | L-T Debt | 45.91% | 45.97% | 42.11% | 44.30% |
| | Preferred Stock | 195,000 | 211,000 | 211,000 | 211,000 | Preferred Stock | 1.46% | 1.58% | 1.75% | 1.64% |
| | Common Equity | 7,043,000 | 7,012,000 | 6,754,000 | 6,947,000 | Common Equity | 52.63% | 52.45% | 56.14% | 54.06% |
| | Total Capital | 13,381,000 | 13,369,000 | 12,031,000 | 12,850,000 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Central Vermont | L-T Debt | 185,343 | 196,018 | 132,988 | 123,431 | L-T Debt | 46.31% | 49.20% | 39.89% | 37.36% |
| | Preferred Stock | 9,054 | 9,054 | 9,054 | 10,054 | Preferred Stock | 2.26% | 2.27% | 2.72% | 3.04% |
| | Common Equity | 205,853 | 193,326 | 191,313 | 196,861 | Common Equity | 51.43% | 48.53% | 57.39% | 59.59% |
| | Total Capital | 400,250 | 398,398 | 333,355 | 330,346 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Cleco Corporatior | L-T Debt | 944,869 | 950,090 | 861,025 | 769,103 | L-T Debt | 51.03% | 52.02% | 50.51% | 48.52% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 906,592 | 876,183 | 843,619 | 816,110 | Common Equity | 48.97% | 47.98% | 49.49% | 51.48% |
| | Total Capital | 1,851,461 | 1,826,273 | 1,704,644 | 1,585,213 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| DPL Inc.(NYSE-I | L-T Debt | 1,276,500 | 1,541,500 | 1,451,600 | 1,451,700 | L-T Debt | 57.50% | 62.66% | 63.37% | 63.70% |
| | Preferred Stock | 22,900 | 22,900 | 22,900 | 22,900 | Preferred Stock | 1.03% | 0.93% | 1.00% | 1.00% |
| | Common Equity | 920,500 | 895,600 | 816,000 | 804,400 | Common Equity | 41.47% | 36.41% | 35.63% | 35.30% |
| | Total Capital | 2,219,900 | 2,460,000 | 2,290,500 | 2,279,000 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Empire District El | L-T Debt | 633,836 | 631,715 | 541,825 | 546,969 | L-T Debt | 54.01% | 53.29% | 49.86% | 50.36% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 539,775 | 553,652 | 544,382 | 539,176 | Common Equity | 45.99% | 46.71% | 50.12% | 49.64% |
| | Total Capital | 1,173,611 | 1,185,367 | 1,086,207 | 1,086,145 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Hawaiian Electric | L-T Debt | 1,229,949 | 2,948,851 | 2,815,707 | 2,701,770 | L-T Debt | 52.11% | 72.68% | 71.97% | 71.16% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 1,130,424 | 1,108,398 | 1,096,568 | 1,095,240 | Common Equity | 47.89% | 27.32% | 28.03% | 28.84% |
| | Total Capital | 2,360,373 | 4,057,249 | 3,912,275 | 3,797,010 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| IDACORP, Inc. (I | L-T Debt | 1,273,028 | 1,153,454 | 1,155,290 | 1,156,880 | L-T Debt | 50.05% | 48.50% | 48.69% | 48.93% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 1,270,660 | 1,224,648 | 1,217,487 | 1,207,315 | Common Equity | 49.95% | 51.50% | 51.31% | 51.07% |
| | Total Capital | 2,543,688 | 2,378,102 | 2,372,777 | 2,364,195 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Northeast Utilities | L-T Debt | 5,560,685 | 5,703,694 | 5,202,837 | 4,609,496 | L-T Debt | 64.84% | 65.99% | 64.00% | 61.27% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 3,015,981 | 2,939,456 | 2,926,776 | 2,913,835 | Common Equity | 35.16% | 34.01% | 36.00% | 38.73% |
| | Total Capital | 8,576,666 | 8,643,150 | 8,129,613 | 7,523,331 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| NSTAR (NYSE-N | L-T Debt | 2,720,102 | 2,014,220 | 2,016,598 | 2,501,400 | L-T Debt | 59.77% | 52.51% | 53.24% | 58.88% |
| | Preferred Stock | 43,000 | 43,000 | 43,000 | 43,000 | Preferred Stock | 0.94% | 1.12% | 1.14% | 1.01% |
| | Common Equity | 1,787,520 | 1,778,484 | 1,728,458 | 1,703,815 | Common Equity | 39.28% | 46.37% | 45.63% | 40.11% |
| | Total Capital | 4,550,622 | 3,835,704 | 3,788,056 | 4,248,215 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Pinnacle West Ca | L-T Debt | 3,094,352 | 3,086,185 | 3,114,579 | 3,127,125 | L-T Debt | 46.13% | 45.16% | 46.77% | 46.96% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 3,612,985 | 3,747,813 | 3,544,201 | 3,531,611 | Common Equity | 53.87% | 54.84% | 53.23% | 53.04% |
| | Total Capital | 6,707,337 | 6,833,998 | 6,658,780 | 6,658,736 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Progress Energy I | L-T Debt | 10,389,000 | 10,393,000 | 8,901,000 | 8,976,000 | L-T Debt | 54.06% | 54.17% | 51.10% | 51.59% |
| | Preferred Stock | | 93000 | | | Preferred Stock | 0.00% | 0.48% | 0.00% | 0.00% |
| | Common Equity | 8,827,000 | 8,700,000 | 8,518,000 | 8,422,000 | Common Equity | 45.94% | 45.35% | 48.90% | 48.41% |
| | Total Capital | 19,216,000 | 19,186,000 | 17,419,000 | 17,398,000 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| UIL Holdings Cor | L-T Debt | 475,031 | 475,031 | 514,719 | 527,147 | L-T Debt | 49.99% | 50.63% | 52.73% | 53.17% |
| | Preferred Stock | | | | | Preferred Stock | 0.00% | 0.00% | 0.00% | 0.00% |
| | Common Equity | 475,175 | 463,243 | 461,410 | 464,291 | Common Equity | 50.01% | 49.37% | 47.27% | 46.83% |
| | Total Capital | 950,206 | 938,274 | 976,129 | 991,438 | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |
| Average | | | | | | L-T Debt | 51.68% | 53.41% | 51.75% | 51.68% |
| | | | | | | Preferred Stock | 0.44% | 0.49% | 0.51% | 0.52% |
| | | | | | | Common Equity | 47.88% | 46.10% | 47.74% | 47.81% |
| | | | | | | Total Capital | 100.00% | 100.00% | 100.00% | 100.00% |

**Exhibit JRW-5**
**Dayton Power and Light Company**
**Senior Capital Cost Rates**

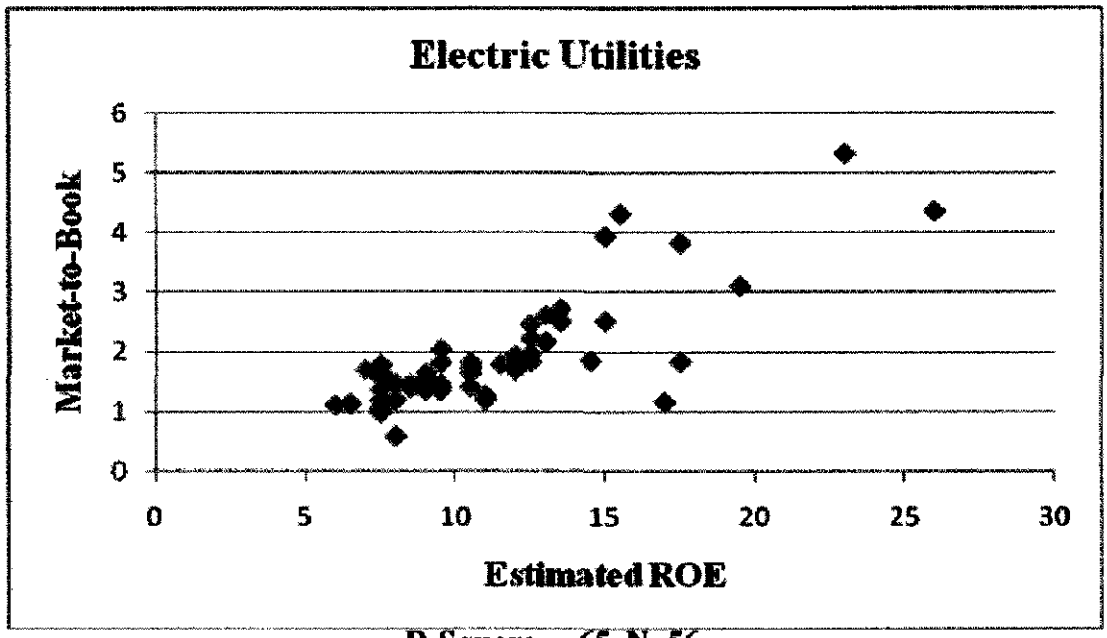
**Panel A - DPL's Long-Term Debt Cost Rate**

| | | |
|---|---|---|
| **Long-Term Debt** | **$** | **1,276.3** |
| **Long-Term Interest** | **$** | **71.3** |
| **Long-Term Debt Cost Rate** | | **5.59%** |

Source: *Value Line Investmetn Survey*, December 26, 2008

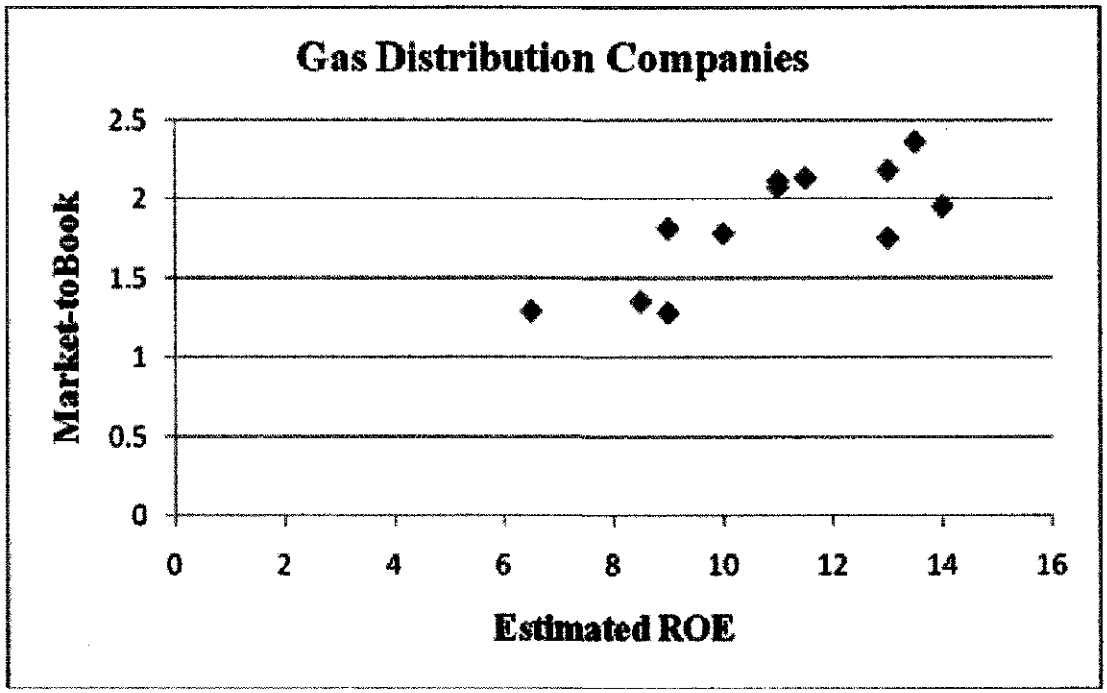
**Exhibit JRW-6**

**Panel A**




R-Square = .65, N=56.

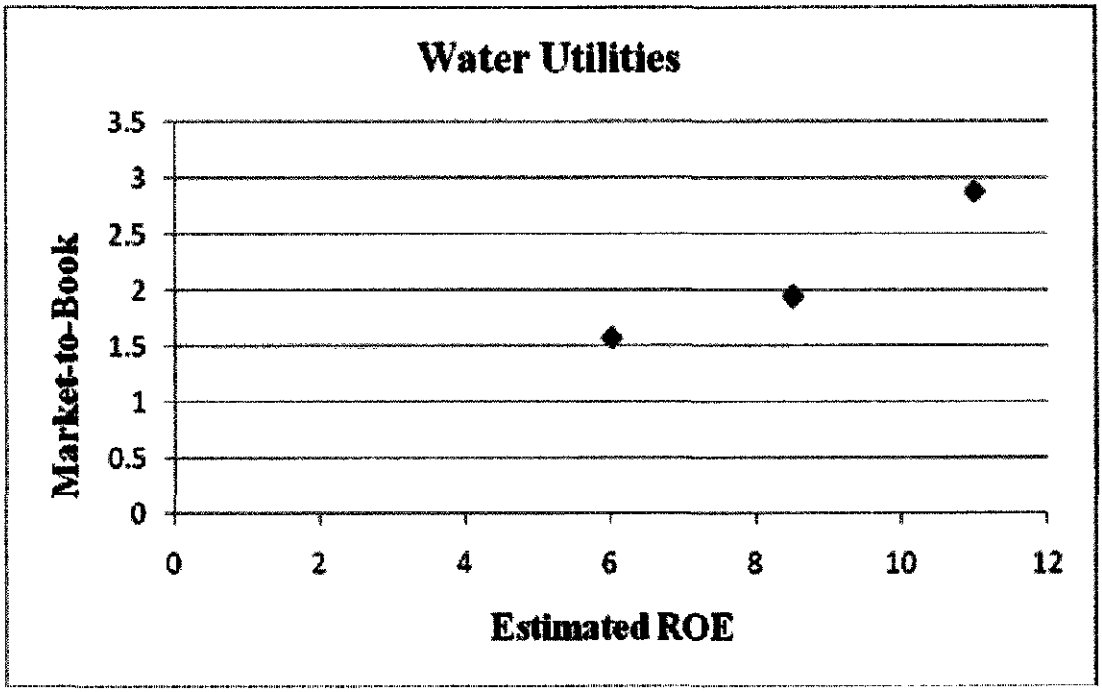
**Panel B**




R-Square = .60, N=12.

**Exhibit JRW-6**

**Panel C**




**R-Square = .92, N=4.**

**Exhibit JRW-7**

**Long-Term 'A' Rated Public Utility Bonds**

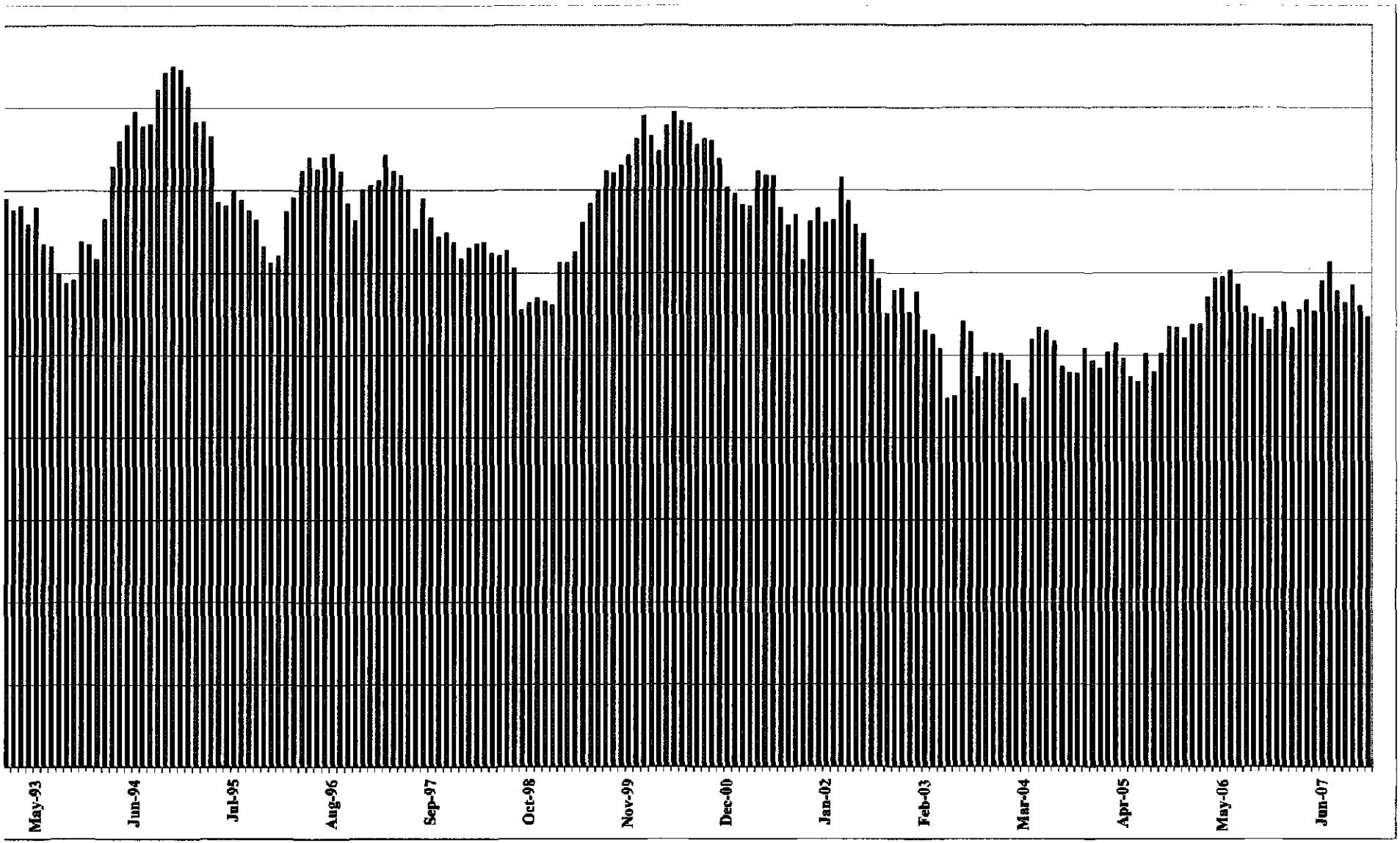
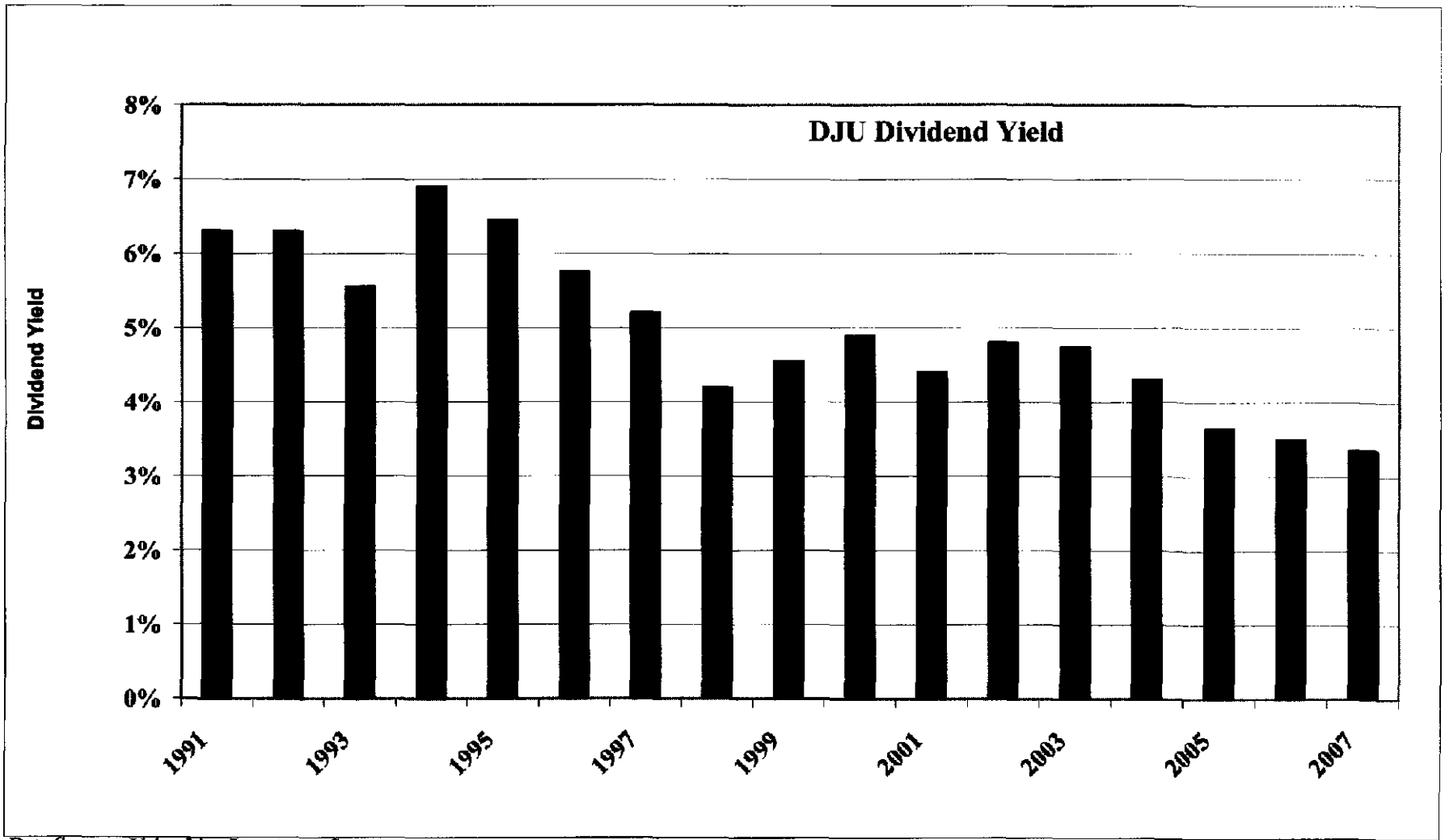


**Exhibit JRW-7**

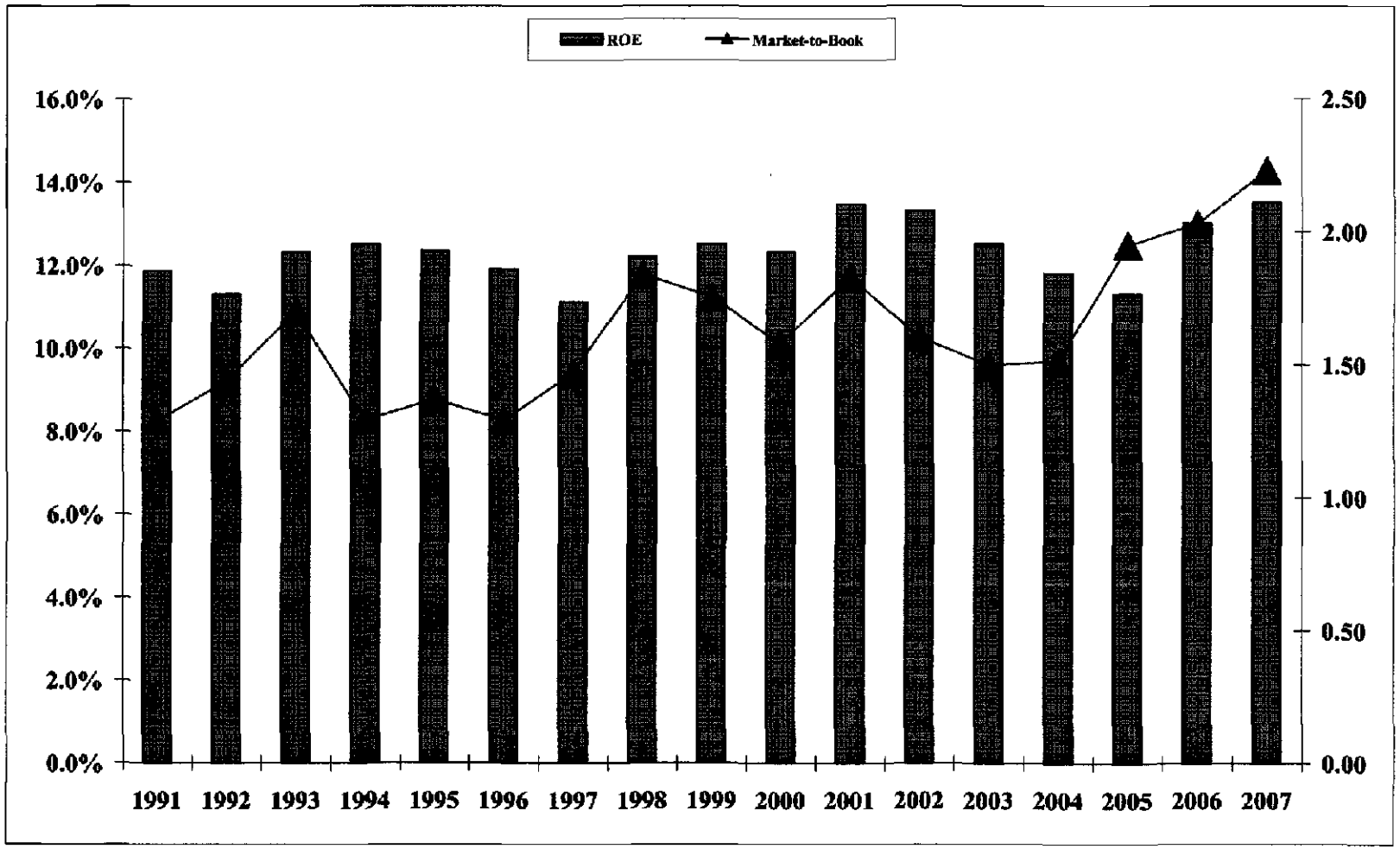
## Dow Jones Utilities Dividend Yield




Data Source: Value Line Investment Survey

**Exhibit JRW-7**

**Dow Jones Utilities - Market to Book and ROE**



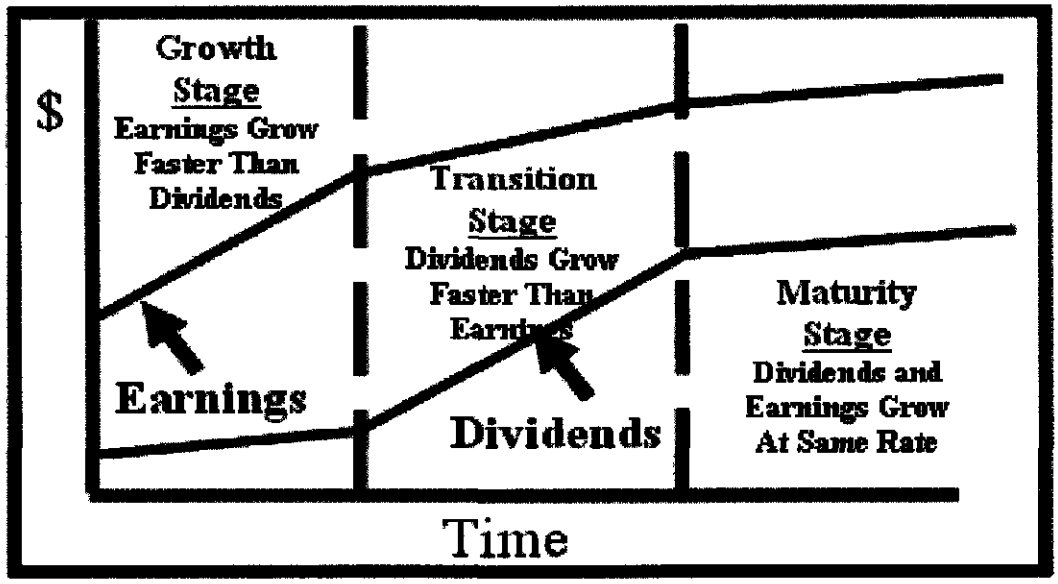

Data Source: Value Line Investment Survey

**Exhibit JRW-8**

**Industry Average Betas**

| Industry Name | Number of Firms | Beta | Industry Name | Number of Firms | Beta | Industry Name | Number of Firms | Beta |
|---|---|---|---|---|---|---|---|---|
| Semiconductor | 138 | 2.59 | Telecom. Services | 152 | 1.34 | Utility (Foreign) | 6 | 1.01 |
| Semiconductor Equip | 16 | 2.51 | Electronics | 179 | 1.32 | Petroleum (Producing) | 186 | 1.00 |
| Wireless Networking | 74 | 2.20 | Investment Co.(Foreign) | 15 | 1.31 | Environmental | 89 | 1.00 |
| E-Commerce | 56 | 2.08 | Educational Services | 39 | 1.27 | Grocery | 15 | 0.99 |
| Entertainment Tech | 38 | 2.06 | Retail (Special Lines) | 164 | 1.26 | Home Appliance | 11 | 0.95 |
| Telecom. Equipment | 124 | 1.98 | Hotel/Gaming | 75 | 1.25 | Insurance (Life) | 40 | 0.94 |
| Steel (Integrated) | 14 | 1.97 | Heavy Construction | 12 | 1.25 | Electric Util. (Central) | 25 | 0.93 |
| Internet | 266 | 1.97 | Retail Building Supply | 9 | 1.23 | Paper/Forest Products | 39 | 0.93 |
| Manuf. Housing/RV | 18 | 1.92 | Railroad | 16 | 1.23 | Restaurant | 75 | 0.93 |
| Power | 58 | 1.87 | Industrial Services | 196 | 1.22 | Natural Gas (Div.) | 31 | 0.93 |
| Computers/Peripherals | 144 | 1.86 | Newspaper | 18 | 1.21 | Healthcare Information | 38 | 0.91 |
| Drug | 368 | 1.78 | Aerospace/Defense | 69 | 1.19 | Property Management | 12 | 0.91 |
| Coal | 18 | 1.71 | Metal Fabricating | 37 | 1.19 | R.E.I.T. | 147 | 0.90 |
| Steel (General) | 26 | 1.71 | Machinery | 126 | 1.19 | Household Products | 28 | 0.89 |
| Securities Brokerage | 31 | 1.66 | Chemical (Diversified) | 37 | 1.16 | Insurance (Prop/Cas.) | 87 | 0.89 |
| Precision Instrument | 103 | 1.66 | Financial Svcs. (Div.) | 294 | 1.14 | Beverage | 44 | 0.89 |
| Homebuilding | 36 | 1.64 | Office Equip/Supplies | 25 | 1.13 | Electric Utility (West) | 17 | 0.88 |
| Advertising | 40 | 1.60 | Packaging & Container | 35 | 1.12 | Maritime | 52 | 0.87 |
| Retail Automotive | 16 | 1.58 | Precious Metals | 84 | 1.11 | Apparel | 57 | 0.87 |
| Cable TV | 23 | 1.56 | Retail Store | 42 | 1.11 | Bank (Midwest) | 38 | 0.85 |
| Computer Software/Svcs | 376 | 1.56 | Furn/Home Furnishings | 39 | 1.10 | Toiletries/Cosmetics | 21 | 0.85 |
| Auto & Truck | 28 | 1.54 | Oilfield Svcs/Equip. | 113 | 1.10 | Electric Utility (East) | 27 | 0.84 |
| Recreation | 73 | 1.54 | Medical Services | 178 | 1.10 | Canadian Energy | 13 | 0.80 |
| Entertainment | 93 | 1.53 | Foreign Electronics | 10 | 1.08 | Food Wholesalers | 19 | 0.79 |
| Chemical (Basic) | 19 | 1.52 | Building Materials | 49 | 1.07 | Water Utility | 16 | 0.78 |
| Biotechnology | 103 | 1.51 | Pharmacy Services | 19 | 1.07 | Natural Gas Utility | 26 | 0.78 |
| Shoe | 20 | 1.47 | Chemical (Specialty) | 90 | 1.06 | Food Processing | 123 | 0.77 |
| Auto Parts | 56 | 1.45 | Metals & Mining (Div.) | 78 | 1.05 | Oil/Gas Distribution | 15 | 0.72 |
| Medical Supplies | 274 | 1.43 | Information Services | 38 | 1.05 | Investment Co. | 18 | 0.71 |
| Air Transport | 49 | 1.40 | Trucking | 32 | 1.04 | Tobacco | 11 | 0.70 |
| Human Resources | 35 | 1.38 | Diversified Co. | 107 | 1.03 | Bank (Canadian) | 8 | 0.67 |
| Publishing | 40 | 1.35 | Petroleum (Integrated) | 26 | 1.02 | Bank | 504 | 0.63 |
| Electrical Equipment | 86 | 1.35 | Reinsurance | 11 | 1.01 | Thrift | 234 | 0.59 |
| Data Source: http://pages.stern.nyu.edu/~adamodar/ | | | | | | Total/Average | 7364 | 1.24 |

**Exhibit JRW-9**
**Three-Stage DCF Model**




Source: William F. Sharpe, Gordon J. Alexander, and Jeffrey V. Bailey, Investments (Prentice-Hall, 1995), pp. 590-91.

**Exhibit JRW-10**

**Dayton Power and Light Company**
**Discounted Cash Flow Analysis**

**Electric Proxy Group**

| | |
|---|---|
| Dividend Yield* | 5.3% |
| Adjustment Factor | 1.023 |
| Adjusted Dividend Yield | 5.4% |
| Growth Rate** | 4.6% |
| Equity Cost Rate | 10.0% |

* Page 2 of Exhibit JRW-6

** Based on data provided on pages 3, 4, and 5 of Exhibit JRW-6

**Exhibit JRW-10**

***Dayton Power and Light Company***
**Monthly Dividend Yields**
**August 2008 - January 2009**

**Electric Proxy Group**

| Company | Aug | Sep | Oct | Nov | Dec | Jan | Mean |
|---|---|---|---|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 4.2% | 4.0% | 3.8% | 4.6% | 5.1% | 5.5% | 4.5% |
| Ameren Corporation (NYSE-AEE) | 6.3% | 6.0% | 6.1% | 8.4% | 7.9% | 7.8% | 7.1% |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 4.4% | 3.7% | 3.7% | 4.4% | 5.2% | 4.4% | 4.3% |
| Cleco Corporation (NYSE-CNL) | 3.8% | 3.5% | 3.4% | 4.2% | 4.2% | 4.2% | 3.9% |
| DPL Inc.(NYSE-DPL) | 4.1% | 4.5% | 4.2% | 4.9% | 5.4% | 5.1% | 4.7% |
| Empire District Electric Co. (NYSE-EDE) | 6.7% | 5.9% | 5.6% | 7.0% | 7.4% | 7.6% | 6.7% |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 5.2% | 4.9% | 4.4% | 5.1% | 4.7% | 5.6% | 5.0% |
| IDACORP, Inc. (NYSE-IDA) | 4.1% | 3.9% | 3.8% | 4.7% | 4.2% | 4.1% | 4.1% |
| Northeast Utilities (NYSE-NU) | 3.5% | 3.1% | 3.2% | 4.1% | 3.8% | 3.8% | 3.6% |
| NSTAR (NYSE-NST) | 4.4% | 4.2% | 3.9% | 4.8% | 4.6% | 4.2% | 4.4% |
| Pinnacle West Capital Corp. (NYSE-PNW) | 6.7% | 6.0% | 6.0% | 6.9% | 7.4% | 6.9% | 6.7% |
| Progress Energy Inc. (NYSE-PGN) | 6.0% | 5.6% | 5.5% | 6.8% | 6.6% | 6.3% | 6.1% |
| UIL Holdings Corporation (NYSE-UIL) | 5.9% | 5.1% | 4.9% | 5.3% | 5.9% | 5.8% | 5.5% |
| **Mean** | 5.0% | 4.6% | 4.5% | 5.5% | 5.6% | 5.5% | 5.1% |

Source: *AUS Utility Reports*, monthly issues.

**Exhibit JRW-10**

**Dayton Power and Light Company**
**DCF Equity Cost Growth Rate Measures**
***Value Line* Historic Growth Rates**

**Electric Proxy Group**

| Company | *Value Line* Historic Growth | | | | | |
|---|---|---|---|---|---|---|
| | Past 10 Years | | | Past 5 Years | | |
| | Earnings | Dividends | Book Value | Earnings | Dividends | Book Value |
| ALLETE, Inc. (NYSE-ALE) | NA | NA | NA | NA | NA | NA |
| Ameren Corporation (NYSE-AEE) | 0.5% | 0.0% | 3.5% | -0.5% | 0.0% | 5.5% |
| Central Vermont Public Serv. Corp. (NYSE-CV) | -2.5% | 1.0% | 1.0% | -2.5% | 1.0% | 2.0% |
| Cleco Corporation (NYSE-CNL) | 2.5% | 1.5% | 6.5% | -2.0% | 0.5% | 7.0% |
| DPL Inc.(NYSE-DPL) | 1.0% | 1.5% | -0.5% | -1.0% | 1.0% | 2.5% |
| Empire District Electric Co. (NYSE-EDE) | -1.0% | 0.0% | 2.0% | 2.0% | 0.0% | 2.0% |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | -0.5% | 0.5% | 1.5% | -3.0% | 0.0% | 2.0% |
| IDACORP, Inc. (NYSE-IDA) | -1.0% | -4.5% | 3.5% | -7.0% | -8.5% | 2.5% |
| Northeast Utilities (NYSE-NU) | 11.0% | -4.5% | 0.5% | 8.5% | 9.5% | 2.5% |
| NSTAR (NYSE-NST) | 4.5% | 3.0% | 3.5% | 3.5% | 3.5% | 4.0% |
| Pinnacle West Capital Corp. (NYSE-PNW) | 1.0% | 7.0% | 4.5% | -2.5% | 5.5% | 3.5% |
| Progress Energy Inc. (NYSE-PGN) | 0.0% | 3.0% | 6.0% | -4.5% | 2.5% | 3.0% |
| UIL Holdings Corporation (NYSE-UIL) | -2.0% | 0.0% | 0.5% | -6.0% | 0.0% | -1.0% |
| **Mean** | 1.1% | 0.7% | 2.7% | -1.3% | 1.3% | 3.0% |
| **Median** | 0.3% | 0.8% | 2.8% | -2.3% | 0.8% | 2.5% |
| Data Source: *Value Line Investment Survey, 2008.* | **Average of Mean and Median I** | | | 1.0% | | |

**Exhibit JRW-10**

**Dayton Power and Light Company**
**DCF Equity Cost Growth Rate Measures**
***Value Line* Projected Growth Rates**

**Electric Proxy Group**

| Company | *Value Line* Projected Growth Est'd. '05-'07 to '11-'13 | | | *Value Line* Internal Growth | | |
|---|---|---|---|---|---|---|
| | Earnings | Dividends | Book Value | Return on Equity | Retention Rate | Internal Growth |
| ALLETE, Inc. (NYSE-ALE) | 0.0% | 4.5% | 4.5% | 8.5% | 25.0% | 2.1% |
| Ameren Corporation (NYSE-AEE) | 4.5% | 0.0% | 2.0% | 10.5% | 34.0% | 3.6% |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 7.5% | 0.0% | 3.0% | 7.5% | 44.0% | 3.3% |
| Cleco Corporation (NYSE-CNL) | 10.5% | 9.5% | 6.0% | 11.5% | 38.0% | 4.4% |
| DPL Inc.(NYSE-DPL) | 11.0% | 5.0% | 8.5% | 20.0% | 43.0% | 8.6% |
| Empire District Electric Co. (NYSE-EDE) | 10.0% | 1.5% | 3.0% | 10.5% | 27.0% | 2.8% |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 5.0% | 1.0% | 2.5% | 11.0% | 31.0% | 3.4% |
| IDACORP, Inc. (NYSE-IDA) | 2.0% | 0.0% | 2.0% | 7.5% | 47.0% | 3.5% |
| Northeast Utilities (NYSE-NU) | 12.0% | 7.0% | 5.5% | 9.0% | 52.0% | 4.7% |
| NSTAR (NYSE-NST) | 7.5% | 7.0% | 5.5% | 14.5% | 39.0% | 5.7% |
| Pinnacle West Capital Corp. (NYSE-PNW) | 2.0% | 1.0% | 2.0% | 8.0% | 29.0% | 2.3% |
| Progress Energy Inc. (NYSE-PGN) | 5.0% | 1.0% | 2.0% | 9.5% | 25.0% | 2.4% |
| UIL Holdings Corporation (NYSE-UIL) | 4.0% | 0.0% | 1.0% | 11.0% | 18.0% | 2.0% |
| **Mean** | 6.2% | 2.9% | 3.7% | 10.7% | 34.8% | 3.7% |
| **Median** | 5.0% | 1.0% | 3.0% | 10.5% | 34.0% | 3.6% |
| **Average of Mean and Median Figures =** | | 3.6% | | | Average = | 3.6% |

Data Source: *Value Line Investment Survey, 2008.*

**Exhibit JRW-10**

**DCF Equity Cost Growth Rate Measures**
**Analysts Projected EPS Growth Rate Estimates**

**Electric Proxy Group**

| Company | Yahoo First Call Mean | Zack's Mean | Average |
|---|---|---|---|
| ALLETE, Inc. (NYSE-ALE) | 6.50% | 5.00% | 5.75% |
| Ameren Corporation (NYSE-AEE) | 4.00% | 5.50% | 4.75% |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 8.90% | - | 8.90% |
| Cleco Corporation (NYSE-CNL) | 13.63% | 13.00% | 13.32% |
| DPL Inc.(NYSE-DPL) | 10.67% | 10.30% | 10.49% |
| Empire District Electric Co. (NYSE-EDE) | 6.00% | - | 6.00% |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 4.50% | 4.50% | 4.50% |
| IDACORP, Inc. (NYSE-IDA) | 5.00% | 6.00% | 5.50% |
| Northeast Utilities (NYSE-NU) | 7.18% | 10.00% | 8.59% |
| NSTAR (NYSE-NST) | 6.67% | 6.80% | 6.74% |
| Pinnacle West Capital Corp. (NYSE-PNW) | 3.92% | 6.00% | 4.96% |
| Progress Energy Inc. (NYSE-PGN) | 5.96% | 5.00% | 5.48% |
| UIL Holdings Corporation (NYSE-UIL) | 6.00% | 6.00% | 6.00% |
| **Mean** | | | 7.00% |
| **Median** | | | 6.00% |
| **Average** | | | 6.50% |

Data Sources: www.zacks.com, http://quote.yahoo.com, 2008

**Exhibit JRW-10**

**Dayton Power and Light Company**
**DCf Growth Rate Indicators**

**Electric Proxy Group**

| Growth Rate Indicator | |
|---|---|
| Historic Value Line Growth in EPS, DPS, and BVPS | 1.00% |
| Projected *Value Line* Growth in EPS, DPS, and BVPS | 3.60% |
| Internal Growth ROE * Retention Rate | 3.60% |
| Projected EPS Growth from Bloomberg and Zacks | 6.50% |
| Average of Historic and Projected Growth Rates | 3.7% |

**Exhibit JRW-11**

**Capital Asset Pricing Model**

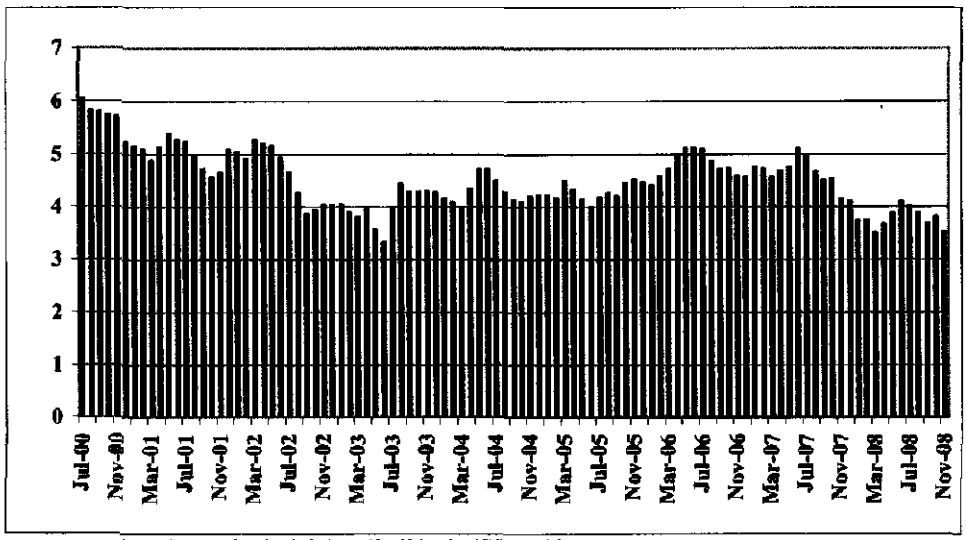
**Electric Proxy Group**

| | |
|---|---|
| **Risk-Free Interest Rate** | **3.50%** |
| **Beta*** | **0.75** |
| **Ex Ante Equity Risk Premium**** | **4.77%** |
| **CAPM Cost of Equity** | **7.1%** |

* See page 2 of Exhibit JRW-7

** See page 3 of Exhibit JRW-7

**Exhibit JRW-11**
**Ten-Year U.S. Treasury Yields**
**January 2000-November 2008**



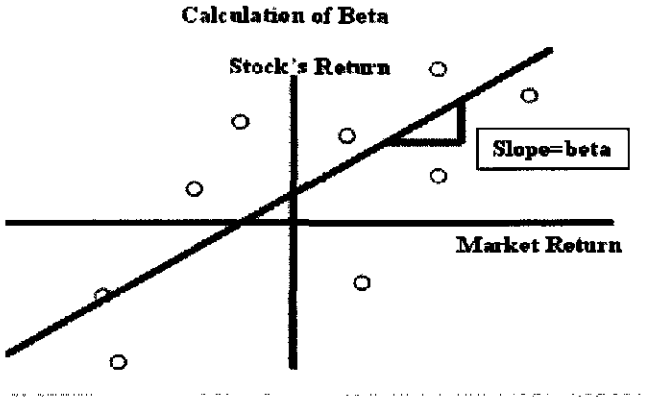

http://research.stlouisfed.org/fred2/series/GS10?cid=115

**U.S. Treasury Yields**

U.S. Treasuries

| | COUPON | MATURITY DATE | CURRENT PRICE/YIELD |
|---|---|---|---|
| 3-MONTH | 0.000 | 04/09/2009 | 0.14 / .14 |
| 6-MONTH | 0.000 | 07/09/2009 | 0.31 / .32 |
| 12-MONTH | 0.000 | 12/17/2009 | 0.42 / .43 |
| 2-YEAR | 0.875 | 12/31/2010 | 100-24+ / .85 |
| 3-YEAR | 1.125 | 12/15/2011 | 99-28+ / 1.16 |
| 5-YEAR | 1.500 | 12/31/2013 | 99-20+ / 1.74 |
| 10-YEAR | 3.750 | 11/15/2018 | 110-03+ / 2.58 |
| 30-YEAR | 4.500 | 02/15/2036 | 128-16+ / 3.15 |

**Exhibit JRW-11**




**Electric Proxy Group**

| Company | Beta |
|---|---|
| ALLETE, Inc. (NYSE-ALE) | 0.75 |
| Ameren Corporation (NYSE-AEE) | 0.80 |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 0.90 |
| Cleco Corporation (NYSE-CNL) | 0.80 |
| DPL Inc.(NYSE-DPL) | 0.65 |
| Empire District Electric Co. (NYSE-EDE) | 0.75 |
| Hawaiian Electric Industries, Inc. (NYSE-HE) | 0.75 |
| IDACORP, Inc. (NYSE-IDA) | 0.85 |
| Northeast Utilities (NYSE-NU) | 0.75 |
| NSTAR (NYSE-NST) | 0.70 |
| Pinnacle West Capital Corp. (NYSE-PNW) | 0.75 |
| Progress Energy Inc. (NYSE-PGN) | 0.60 |
| UIL Holdings Corporation (NYSE-UIL) | 0.70 |
| **Mean** | 0.75 |

Data Source: *Value Line Investment Survey, 2008.*

## Exhibit JRW-11

### Dayton Power and Light Company
### Risk Premium Approaches

| | Historical Ex Post Excess Returns | Surveys | Ex Ante Models and Market Data |
|---|---|---|---|
| Means of Assessing the Equity-Bond Risk Premium | Historical average is a popular proxy for the ex ante premium – but likely to be misleading | Investor and expert surveys can provide direct estimates of prevailing expected returns/premiums | Current financial market prices (simple valuation ratios or DCF-based measures) can give most objective estimates of feasible ex ante equity-bond risk premium |
| Problems/Debated Issues | Time variation in required returns and systematic selection and other biases have boosted valuations over time, and have exaggerated realized excess equity returns compared with ex ante expected premiums | Limited survey histories and questions of survey representativeness.<br><br>Surveys may tell more about hoped-for expected returns than about objective required premiums due to irrational biases such as extrapolation. | Assumptions needed for DCF inputs, notably the trend earnings growth rate, make even these models' outputs subjective.<br><br>The range of views on the growth rate, as well as the debate on the relevant stock and bond yields, leads to a range of premium estimates. |

Source: Antti Ilmanen, Expected Returns on Stocks and Bonds,"
*Journal of Portfolio Management*, (Winter 2003).

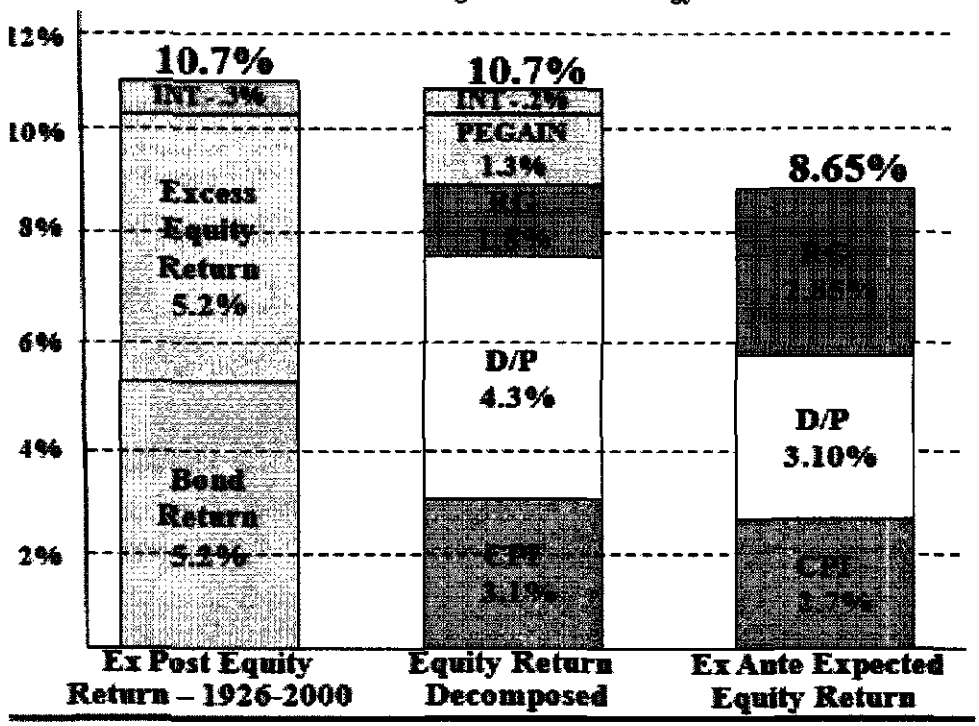
**Exhibit JRW-11**

**Dayton Power and Light Company**
**Capital Asset Pricing Model**
**Equity Risk Premium**

| Category | Study Authors | Publication Date | Time Period Of Study | Methodology | Return Measure | Range Low | Range High | Midpoint of Range | Mean | Average |
|---|---|---|---|---|---|---|---|---|---|---|
| **Historical Risk Premium** | | | | | | | | | | |
| | Ibbotson | 2008 | 1926-2007 | Historical Stock Returns - Bond Returns | Arithmetic | | | | 6.50% | |
| | | | | | Geometric | | | | 4.90% | |
| | Bate | 2008 | 1900-2007 | Historical Stock Returns - Bond Returns | Geometric | | | | 4.50% | |
| | Shiller | 2006 | 1926-2005 | Historical Stock Returns - Bond Returns | Arithmetic | | | | 7.00% | |
| | | | | | Geometric | | | | 5.50% | |
| | Damodoran | 2006 | 1926-2005 | Historical Stock Returns - Bond Returns | Arithmetic | | | | 6.70% | |
| | | | | | Geometric | | | | 5.10% | |
| | Siegel | 2005 | 1926-2005 | Historical Stock Returns - Bond Returns | Arithmetic | | | | 6.10% | |
| | | | | | Geometric | | | | 4.60% | |
| | Dimson, Marsh, and Staunton | 2006 | 1900-2005 | Historical Stock Returns - Bond Returns | Arithmetic | | | | 5.50% | |
| | Goyal & Welch | 2006 | 1872-2004 | Historical Stock Returns - Bond Returns | | | | | 4.77% | |
| | AVERAGE | | | | | | | | | 5.56% |
| **Ex Ante Models (Puzzle Research)** | | | | | | | | | | |
| | Claus Thomas | 2001 | 1985-1998 | Abnormal Earnings Model | | | | | 3.00% | |
| | Arnott and Bernstein | 2002 | 1810-2001 | Fundamentals - Div Yld + Growth | | | | | 2.40% | |
| | Constantinides | 2002 | 1872-2000 | Historical Returns & Fundamentals - P/D & P/E | | | | | 6.90% | |
| | Cornell | 1999 | 1926-1997 | Historical Returns & Fundamental GDP/Earnings | | 3.50% | 5.50% | 4.50% | 4.50% | |
| | Easton, Taylor, et al | 2002 | 1981-1998 | Residual Income Model | | | | | 5.30% | |
| | Fama French | 2002 | 1951-2000 | Fundamental DCF with EPS and DPS Growth | | 2.55% | 4.32% | | 3.44% | |
| | Harris & Marston | 2001 | 1982-1998 | Fundamental DCF with Analysts' EPS Growth | | | | | 7.14% | |
| | Best & Byrne | 2001 | | | | | | | | |
| | McKinsey | 2002 | 1962-2002 | Fundamental (P/E, D/P, & Earnings Growth) | | 3.50% | 4.00% | | 3.75% | |
| | Siegel | 2005 | 1802-2001 | Historical Earnings Yield | Geometric | | | | 2.50% | |
| | Grabowski | 2006 | 1926-2005 | Historical and Projected | | 3.50% | 6.00% | 4.75% | 4.75% | |
| | Maheu & McCurdy | 2006 | 1885-2003 | Historical Excess Returns, Structural Breaks, | | 4.02% | 5.10% | 4.56% | 4.56% | |
| | Bostock | 2004 | 1960-2002 | Bond Yields, Credit Risk, and Income Volatility | | 3.90% | 1.30% | 2.60% | 2.60% | |
| | Bakshi & Chen | 2005 | 1982-1998 | Fundamentals - Interest Rates | | | | | 7.31% | |
| | Donaldson, Kamstra, & Kramer | 2006 | 1952-2004 | Fundamental, Dividend yld., Returns,, & Volatility | | 3.00% | 4.00% | 3.50% | 3.50% | |
| | Campbell | 2008 | 1982-2007 | Historical & Projections (D/P & Earnings Growth) | | 4.10% | 5.40% | | 4.75% | |
| | Best & Byrne | 2001 | Projection | Fundamentals - Div Yld + Growth | | | | | 2.00% | |
| | Fernandez | 2007 | Projection | Required Equity Risk Premium | | | | | 4.00% | |
| | DeLong & Magin | 2008 | Projection | Earnings Yield - TIPS | | | | | 3.22% | |
| | Damodoran | 2008 | Projection | Fundamentals - Implied from FCF to Equity Model | | | | | 4.37% | |
| | **Social Security** | | | | | | | | | |
| | Office of Chief Actuary | | 1900-1995 | | | | | | | |
| | John Campbell | 2001 | 1860-2000 | Historical & Projections (D/P & Earnings Growth) | Arithmetic | 3.00% | 4.00% | 3.50% | 3.50% | |
| | | | Projected for 75 Years | | Geometric | 1.50% | 2.50% | 2.00% | 2.00% | |
| | Peter Diamond | 2001 | Projected for 75 Years | Fundamentals (D/P, GDP Growth) | | 3.00% | 4.80% | 3.90% | 3.90% | |
| | John Shoven | 2001 | Projected for 75 Years | Fundamentals (D/P, P/E, GDP Growth) | | 3.00% | 3.50% | 3.25% | 3.25% | |
| | AVERAGE | | | | | | | | | 4.03% |
| **Surveys** | | | | | | | | | | |
| | Survey of Financial Forecasters | 2008 | 10-Year Projection | About 50 Financial Forecastsers | | | | | 1.96% | |
| | Duke - CFO Magazine Survey | 2008 | 10-Year Projection | Approximately 500 CFOs | | | | | 5.00% | |
| | Welch - Academics | 2008 | 30-Year Projection | Random Academics | | 5.00% | 5.74% | | 5.37% | |
| | AVERAGE | | | | | | | | | 4.11% |
| **Building Block** | | | | | | | | | | |
| | Ibbotson and Chen | 2008 | 1926-2007 | Historical Supply Model (D/P & Earnings Growth) | Arithmetic | | | 6.23% | 5.24% | |
| | | | | | Geometric | | | 4.24% | | |
| | Woolridge | | 2008 | Current Supply Model (D/P & Earnings Growth) | | | | | 5.54% | |
| | AVERAGE | | | | | | | | | 5.39% |
| **OVERALL AVERAGE** | | | | | | | | | | 4.77% |

**Exhibit JRW-11**

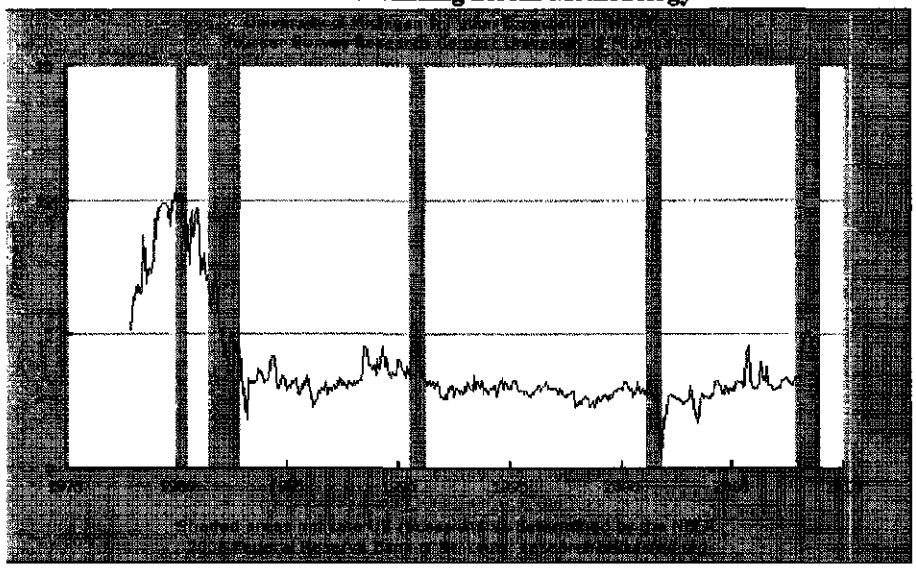
**Dayton Power and Light Company**
**Decomposing Equity Market Returns**
**The Building Blocks Methodology**




Source: Antti Ilmanen, Expected Returns on Stocks and Bonds," *Journal of Portfolio Management*, (Winter 2003).

**Exhibit JRW-11**

**Dayton Power and Light Company**
**Decomposing Equity Market Returns**
**The Building Blocks Methodology**



(Data Source: http://research.stlouisfed.org/fred2/series/MICH/98)

**Exhibit JRW-11**

**Dayton Power and Light Company**

**Survey of Professional Forecasters**
**Philadelphia Federal Reserve Bank**
**Long-Term Forecasts**

Table Seven
LONG-TERM (10 YEAR) FORECASTS

| SERIES: CPI INFLATION RATE | |
|---|---|
| STATISTIC | |
| MINIMUM | 1.600 |
| LOWER QUARTILE | 2.200 |
| MEDIAN | 2.500 |
| UPPER QUARTILE | 2.750 |
| MAXIMUM | 4.200 |
| | |
| MEAN | 2.520 |
| STD. DEV. | 0.520 |
| N | 45 |
| MISSING | 5 |

| SERIES: REAL GDP GROWTH RATE | |
|---|---|
| STATISTIC | |
| MINIMUM | 2.200 |
| LOWER QUARTILE | 2.500 |
| MEDIAN | 2.750 |
| UPPER QUARTILE | 2.800 |
| MAXIMUM | 3.100 |
| | |
| MEAN | 2.700 |
| STD. DEV. | 0.230 |
| N | 43 |
| MISSING | 7 |

| SERIES: PRODUCTIVITY GROWTH | |
|---|---|
| STATISTIC | |
| MINIMUM | 0.900 |
| LOWER QUARTILE | 1.800 |
| MEDIAN | 2.000 |
| UPPER QUARTILE | 2.200 |
| MAXIMUM | 3.000 |
| | |
| MEAN | 2.000 |
| STD. DEV. | 0.390 |
| N | 39 |
| MISSING | 11 |

| SERIES: STOCK RETURNS (S&P 500) | |
|---|---|
| STATISTIC | |
| MINIMUM | 2.700 |
| LOWER QUARTILE | 6.000 |
| MEDIAN | 6.500 |
| UPPER QUARTILE | 8.000 |
| MAXIMUM | 9.000 |
| | |
| MEAN | 6.800 |
| STD. DEV. | 1.300 |
| N | 31 |
| MISSING | 19 |

| SERIES: BOND RETURNS (10-YEAR) | |
|---|---|
| STATISTIC | |
| MINIMUM | 3.200 |
| LOWER QUARTILE | 4.500 |
| MEDIAN | 5.000 |
| UPPER QUARTILE | 5.200 |
| MAXIMUM | 5.800 |
| | |
| MEAN | 4.840 |
| STD. DEV. | 0.590 |
| N | 38 |
| MISSING | 12 |

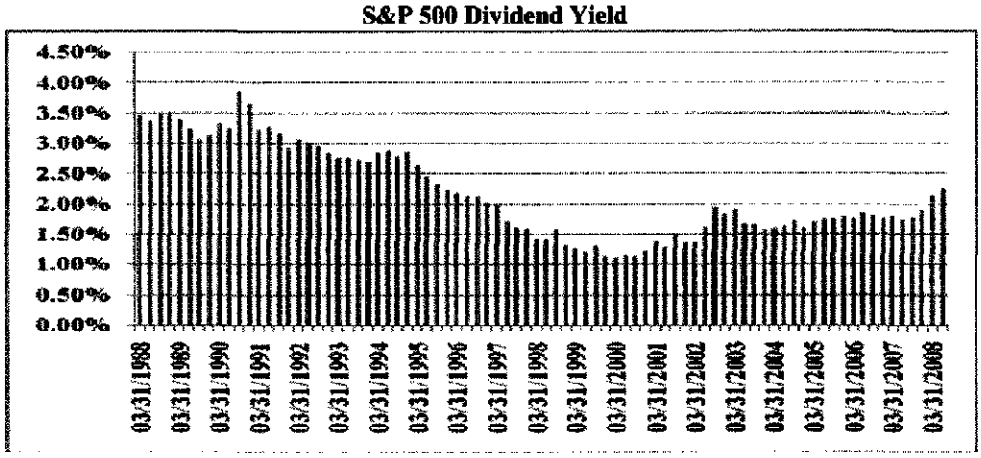
| SERIES: BILL RETURNS (3-MONTH) | |
|---|---|
| STATISTIC | |
| MINIMUM | 2.400 |
| LOWER QUARTILE | 3.000 |
| MEDIAN | 4.000 |
| UPPER QUARTILE | 4.250 |
| MAXIMUM | 5.300 |
| | |
| MEAN | 3.840 |
| STD. DEV. | 0.680 |
| N | 38 |
| MISSING | 12 |

Source: Philadelphia Federal Reserve Bank, Survey of Professional Forecasters, February 12, 2008.
http://www.phil.frb.org/files/spf/spfq107.pdf

**Exhibit JRW-11**

**Dayton Power and Light Company**
**Decomposing Equity Market Returns**
**The Building Blocks Methodology**

**S&P 500 Dividend Yield**




**S&P 500 PE Ratios**

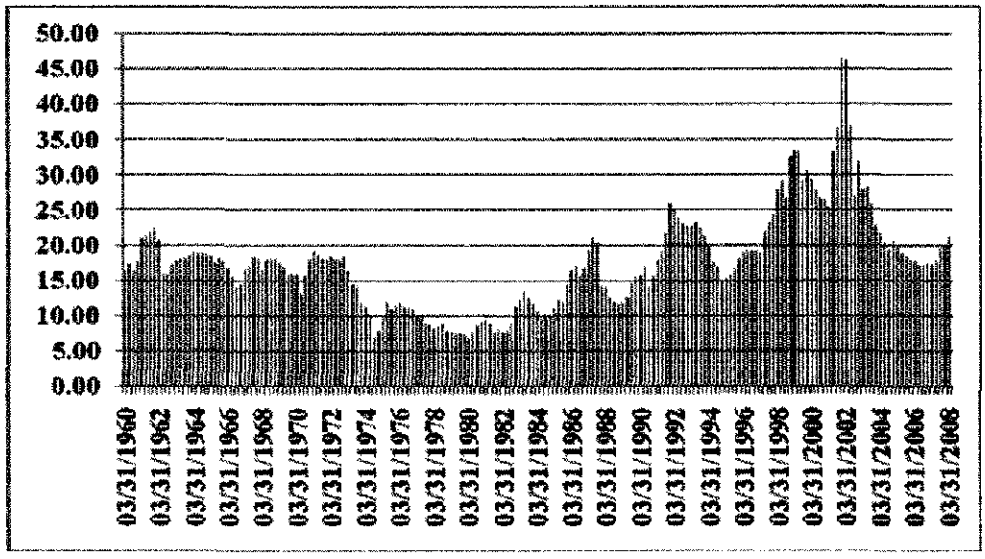


**Exhibit JRW-11**

**Dayton Power and Light Company**
**CAPM**
**Real S&P 500 EPS Growth Rate**

| Year | S&P 500 EPS | Annual Inflation CPI | Inflation Adjustment Factor | Real S&P 500 EPS | |
|---|---|---|---|---|---|
| 1960 | 3.10 | 1.48 | | 3.10 | |
| 1961 | 3.37 | 0.07 | 1.01 | 3.35 | |
| 1962 | 3.67 | 1.22 | 1.02 | 3.59 | |
| 1963 | 4.13 | 1.65 | 1.04 | 3.99 | |
| 1964 | 4.76 | 1.19 | 1.05 | 4.55 | |
| 1965 | 5.30 | 1.92 | 1.07 | 4.97 | |
| 1966 | 5.41 | 3.35 | 1.10 | 4.90 | |
| 1967 | 5.46 | 3.04 | 1.14 | 4.80 | |
| 1968 | 5.72 | 4.72 | 1.19 | 4.81 | |
| 1969 | 6.10 | 6.11 | 1.26 | 4.83 | 10-Year |
| 1970 | 5.51 | 5.49 | 1.34 | 4.13 | 2.89% |
| 1971 | 5.57 | 3.36 | 1.38 | 4.04 | |
| 1972 | 6.17 | 3.41 | 1.43 | 4.33 | |
| 1973 | 7.96 | 8.80 | 1.55 | 5.13 | |
| 1974 | 9.35 | 12.20 | 1.74 | 5.37 | |
| 1975 | 7.71 | 7.01 | 1.86 | 4.14 | |
| 1976 | 9.75 | 4.81 | 1.95 | 4.99 | |
| 1977 | 10.87 | 6.77 | 2.08 | 5.22 | |
| 1978 | 11.64 | 9.03 | 2.27 | 5.13 | |
| 1979 | 14.55 | 13.31 | 2.57 | 5.66 | 10-Year |
| 1980 | 14.99 | 12.40 | 2.89 | 5.18 | 2.30% |
| 1981 | 15.18 | 8.94 | 3.15 | 4.82 | |
| 1982 | 13.82 | 3.87 | 3.27 | 4.23 | |
| 1983 | 13.29 | 3.80 | 3.40 | 3.91 | |
| 1984 | 16.84 | 3.95 | 3.53 | 4.77 | |
| 1985 | 15.68 | 3.77 | 3.66 | 4.28 | |
| 1986 | 14.43 | 1.13 | 3.70 | 3.90 | |
| 1987 | 16.04 | 4.41 | 3.87 | 4.15 | |
| 1988 | 22.77 | 4.42 | 4.04 | 5.64 | |
| 1989 | 24.03 | 4.65 | 4.22 | 5.69 | 10-Year |
| 1990 | 21.73 | 6.11 | 4.48 | 4.85 | -0.65% |
| 1991 | 19.10 | 3.06 | 4.62 | 4.14 | |
| 1992 | 18.13 | 2.90 | 4.75 | 3.81 | |
| 1993 | 19.82 | 2.75 | 4.88 | 4.06 | |
| 1994 | 27.05 | 2.67 | 5.01 | 5.40 | |
| 1995 | 35.35 | 2.54 | 5.14 | 6.88 | |
| 1996 | 35.78 | 3.32 | 5.31 | 6.74 | |
| 1997 | 39.56 | 1.70 | 5.40 | 7.33 | |
| 1998 | 38.23 | 1.61 | 5.48 | 6.97 | |
| 1999 | 45.17 | 2.68 | 5.63 | 8.02 | 10-Year |
| 2000 | 52.00 | 3.39 | 5.82 | 8.93 | 6.29% |
| 2001 | 44.23 | 1.55 | 5.92 | 7.48 | |
| 2002 | 47.24 | 2.38 | 6.06 | 7.80 | |
| 2003 | 54.15 | 1.88 | 6.17 | 8.77 | |
| 2004 | 67.01 | 3.26 | 6.37 | 10.51 | 5-Year |
| 2005 | 68.32 | 3.42 | 6.60 | 10.35 | 3.00% |
| 2006 | 81.96 | 2.54 | 6.77 | 12.11 | |
| 2007 | 87.51 | 4.08 | 7.04 | 12.43 | |
| Data Source: http://pages.stern.nyu.edu/~adamodar/ | | | | Real EPS Growth | **3.0%** |

**Panel A**
**Summary of Dr. Makholm's Equity Cost Rate Approaches and Results**

| Approach | Equity Cost Rate |
|---|---|
| DCF Approach | 12.42% |
| CAPM | |
| Historic Equity Risk Premium | 10.26% |
| Projected Equity Risk Premium | 12.94% |
| Average CAPM | 11.60% |
| | |
| Average of DCF and CAPM Approaches | 11.30% |

**Panel B**
**Summary of Dr. Makholm's DCF Results**

| | |
|---|---|
| Adjusted Dividend Yield | 4.37% |
| Expected Growth | 6.41% |
| DCF Result | 10.78% |
| Flotation Cost Adjustment | 0.22% |
| Adjusted DCF Result | 11.00% |

**Panel C**
**Summary of Dr. Makholm's CAPM Results**

| | Historic Equity Risk Premium | Projected Equity Risk Premium |
|---|---|---|
| Risk-Free Rate | 4.65% | 4.65% |
| Beta | 0.87 | 0.87 |
| Equity Risk Premium | 6.42% | 9.49% |
| CAPM Equity Cost Rate | 10.26% | 12.94% |

**Exhibit JRW-13**

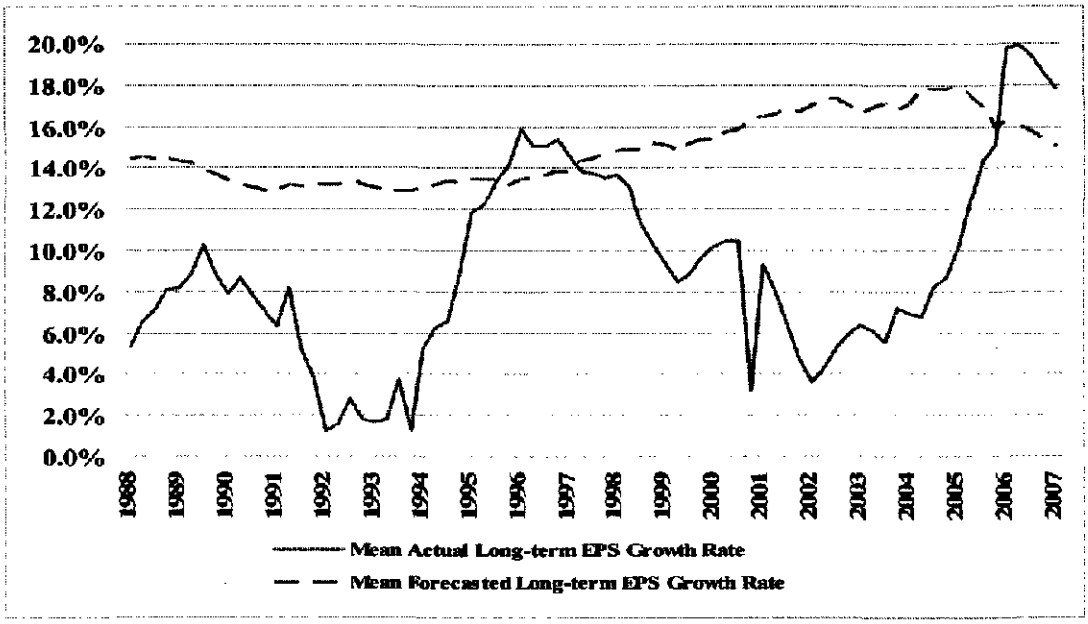
***Dayton Power and Light Company***
**DCF Equity Cost Growth Rate Measures**
***Value Line* Projected Growth Rates**

**Makholm Proxy Group**

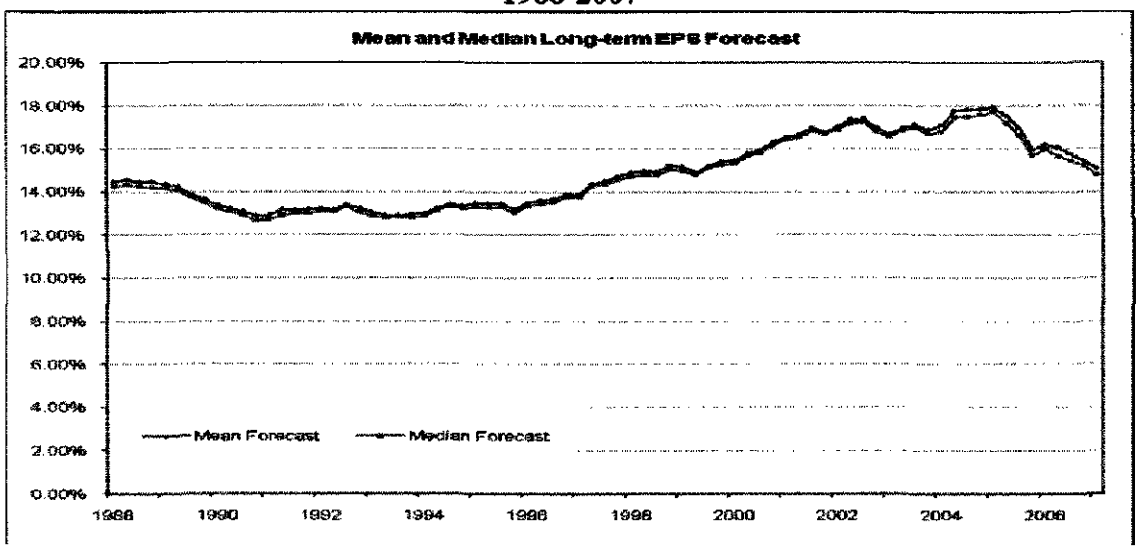
| Company | *Value Line* Projected Growth Est'd. '05-'07 to '11-'13 | | | *Value Line* Internal Growth | | |
|---|---|---|---|---|---|---|
| | Earnings | Dividends | Book Value | Return on Equity | Retention Rate | Internal Growth |
| ALLETE, Inc. (NYSE-ALE) | 0.0% | 4.5% | 4.5% | 8.5% | 25.0% | 2.1% |
| Alliant Energy (NYSE-LNT) | 6.0% | 9.0% | 5.5% | 10.5% | 42.0% | 4.4% |
| Avista Corp (NYSE-AVA) | 9.0% | 12.5% | 3.5% | 8.5% | 35.0% | 3.0% |
| Central Vermont Public Serv. Corp. (NYSE-CV) | 7.5% | 0.0% | 3.0% | 7.5% | 44.0% | 3.3% |
| Cleco Corporation (NYSE-CNL) | 10.5% | 9.5% | 6.0% | 11.5% | 38.0% | 4.4% |
| DPL Inc.(NYSE-DPL) | 11.0% | 5.0% | 8.5% | 20.0% | 43.0% | 8.6% |
| Empire District Electric Co. (NYSE-EDE) | 10.0% | 1.5% | 3.0% | 10.5% | 27.0% | 2.8% |
| IDACORP, Inc. (NYSE-IDA) | 2.0% | 0.0% | 2.0% | 7.5% | 47.0% | 3.5% |
| MGE Energy (NDQ-MGEE) | 6.0% | 0.5% | 7.0% | 12.0% | 44.0% | 5.3% |
| Northeast Utilities (NYSE-NU) | 12.0% | 7.0% | 5.5% | 9.0% | 52.0% | 4.7% |
| NSTAR (NYSE-NST) | 7.5% | 7.0% | 5.5% | 14.5% | 39.0% | 5.7% |
| UIL Holdings Corporation (NYSE-UIL) | 4.0% | 0.0% | 1.0% | 11.0% | 18.0% | 2.0% |
| Unisource Energy (NYSE-UNS) | 0.0% | 3.0% | 3.0% | 7.0% | 30.0% | 2.1% |
| Westar Energy (NYSE-WR) | 2.0% | 5.5% | 7.5% | 7.5% | 38.0% | 2.9% |
| Wisconsin Energy (NYSE-WEC) | 8.0% | 13.0% | 6.0% | 12.5% | 55.0% | 6.9% |
| **Mean** | 6.4% | 5.2% | 4.8% | 10.5% | 38.5% | 4.1% |

Data Source: *Value Line Investment Survey, 2008.*

**Panel A**
**Long-Term Forecasted Versus Actual EPS Growth Rates**
**1988-2007**




**Panel B**
**Long-Term Forecasted EPS Growth Rates**
**1988-2007**




Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term Earnings Per Share Growth Rate Forecasts," (July, 2008).

THE WALL STREET JOURNAL.

# Study Suggests Bias in Analysts' Rosy Forecasts

**By ANDREW EDWARDS**
*March 21, 2008; Page C6*

Despite an economy teetering on the brink of a recession -- if not already in one -- analysts are still painting a rosy picture of earnings growth, according to a study done by Penn State's Smeal College of Business.

The report questions analysts' impartiality five years after then-New York Attorney General Eliot Spitzer forced analysts to pay $1.5 billion in damages after finding evidence of bias.

"Wall Street analysts basically do two things: recommend stocks to buy and forecast earnings," said J. Randall Woolridge, professor of finance. "Previous studies suggest their stock recommendations do not perform well, and now we show that their long-term earnings-per-share growth-rate forecasts are excessive and upwardly biased."

The report, which examined analysts' long-term (three to five years) and one-year per-share earnings expectations from 1984 through 2006 found that companies' long-term earnings growth surpassed analysts' expectations in only two instances, and those came right after recessions.

Over the entire time period, analysts' long-term forecast earnings-per-share growth averaged 14.7%, compared with actual growth of 9.1%. One-year per-share earnings expectations were slightly more accurate: The average forecast was for 13.8% growth and the average actual growth rate was 9.8%.

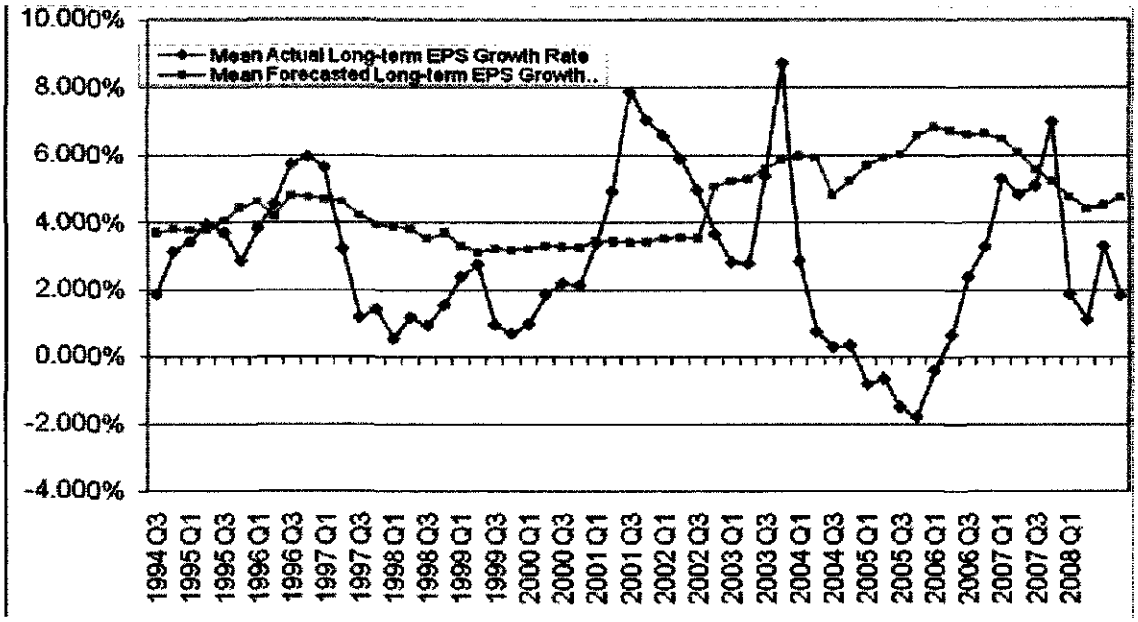
"A significant factor in the upward bias in long-term earnings-rate forecasts is the reluctance of analysts to forecast" profit declines, Mr. Woolridge said. The study found that nearly one-third of all companies experienced profit drops over successive three-to-five-year periods, but analysts projected drops less than 1% of the time.

The study's authors said, "Analysts are rewarded for biased forecasts by their employers, who want them to hype stocks so that the brokerage house can garner trading commissions and win underwriting deals."

They also concluded that analysts are under pressure to hype stocks to generate trading commissions, and they often don't follow stocks they don't like.

**Write to** Andrew Edwards at andrew.edwards@dowjones.com

**Panel C**
**Long-Term Forecasted Versus Actual EPS Growth Rates**
**Electric Utility Companies**
**1988-2007**



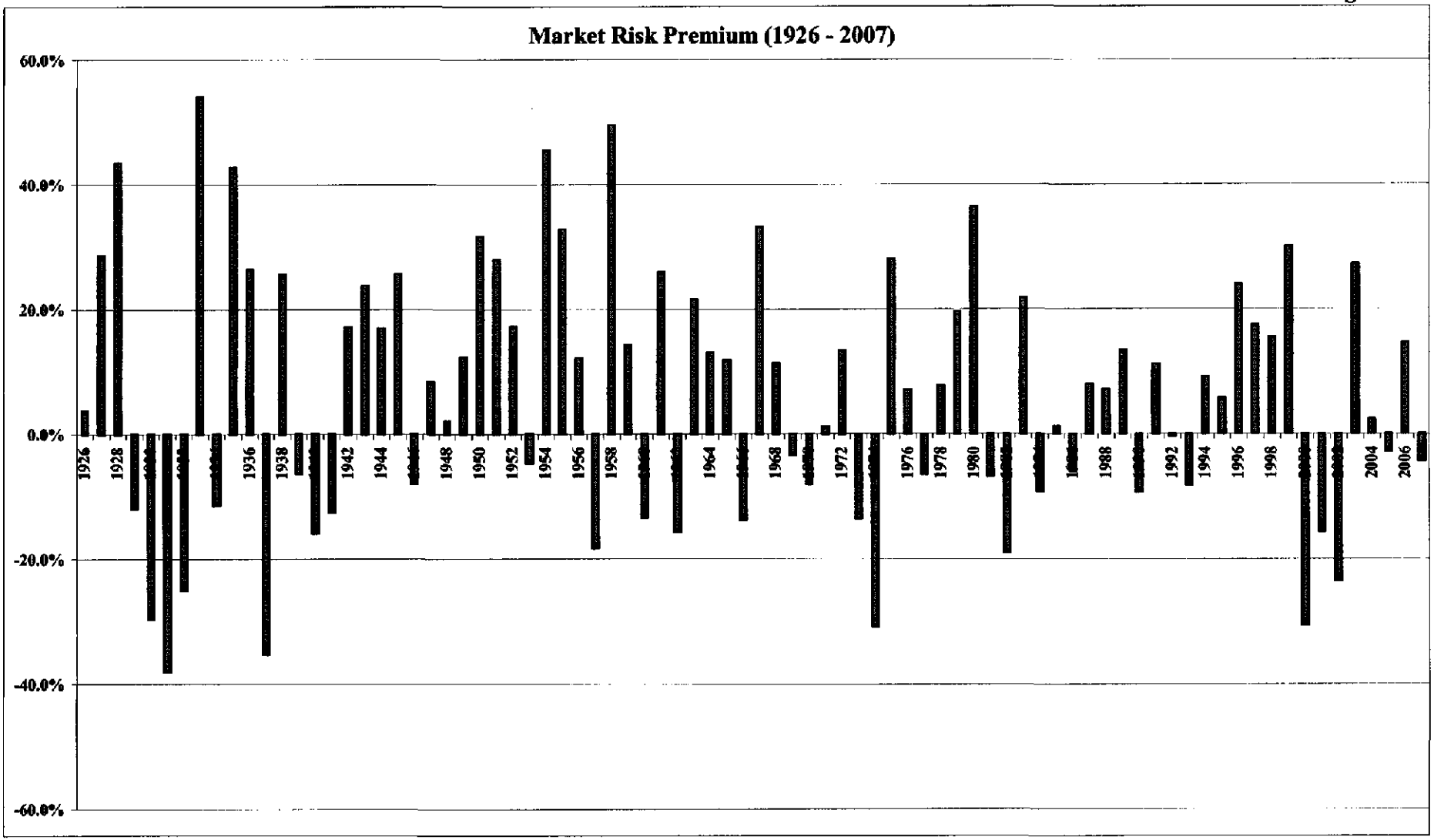
**Panel A**
**Value Line 3-5 year EPS Growth Rate Forecasts**

| | Average Projected EPS Growth rate | Number of Negative EPS Growth Projections | Percent of Negative EPS Growth Projections |
|---|---|---|---|
| 2,453 Companies | 14.60% | 47 | 1.90% |

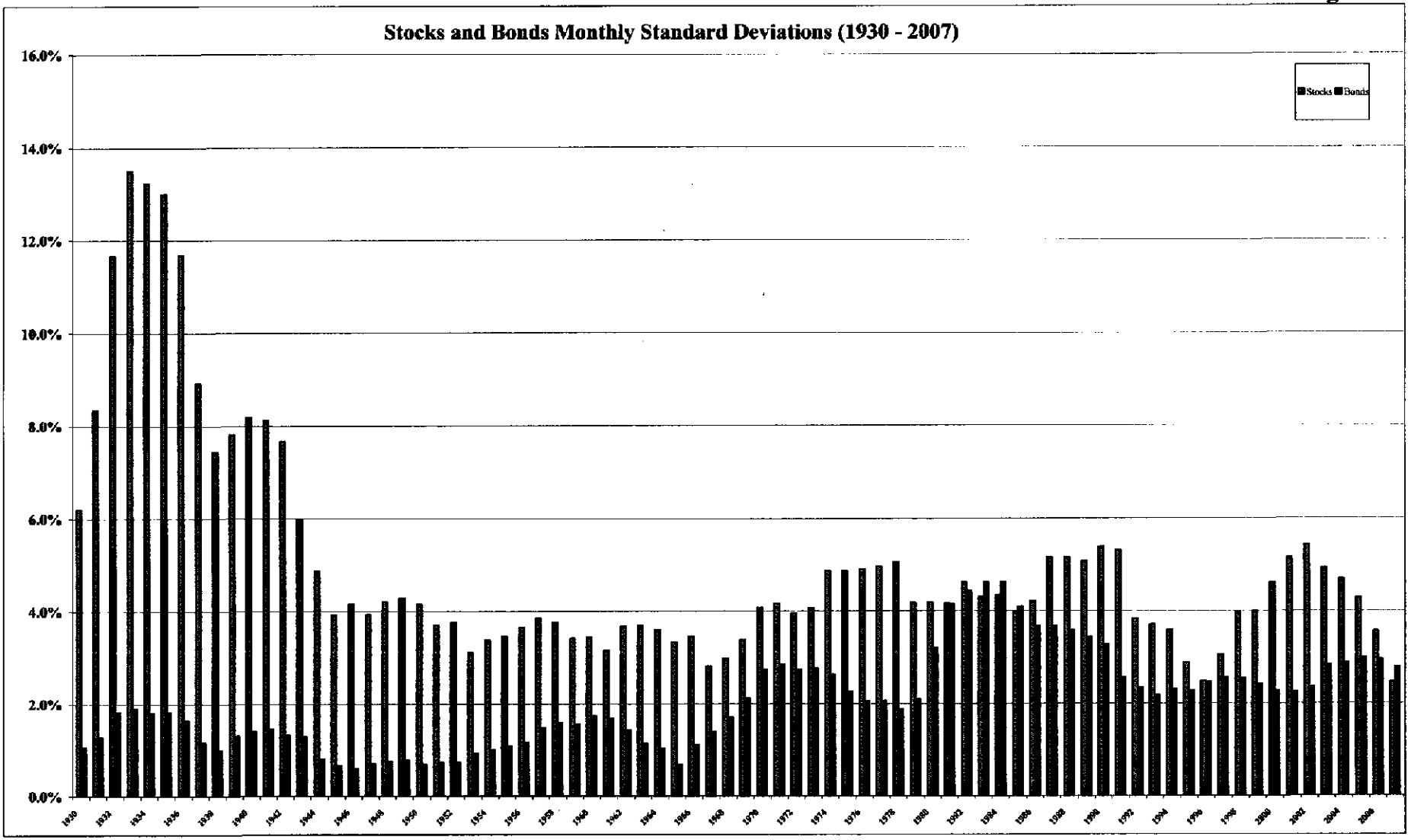
**Panel B**
**Historical Five-Year EPS Growth Rates for Value Line Companies**

| | Average Historical EPS Growth rate | Number with Negative Historical EPS Growth | Percent with Negative Historical EPS Growth |
|---|---|---|---|
| 2,371 Companies | 12.90% | 476 | 20.10% |

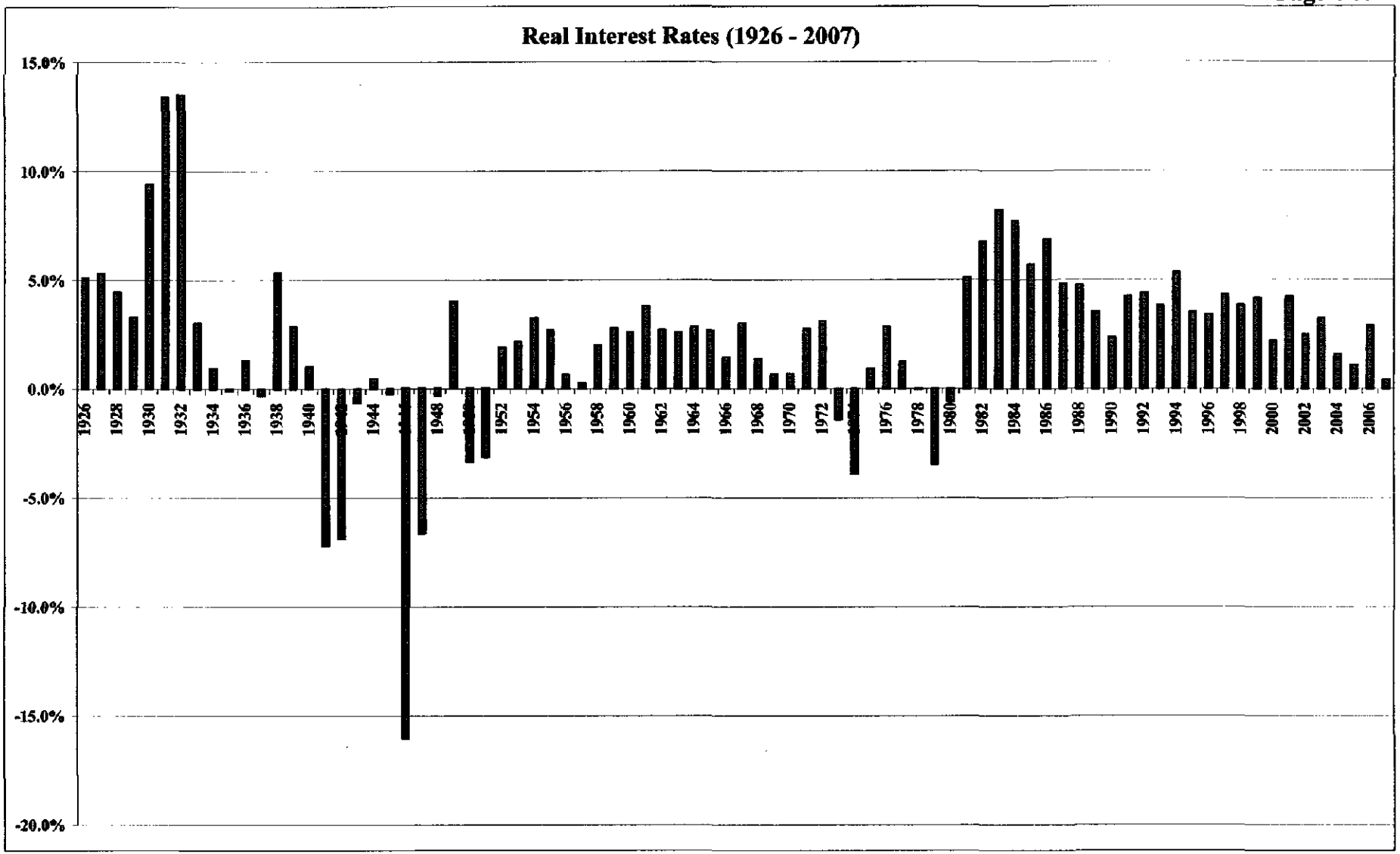

Data Source: Morningstar, *SBBI Yearbook*, 2008.




Data Source: Morningstar, *SBBI Yearbook*, 2008.




Data Source: Morningstar, *SBBI Yearbook*, 2008.



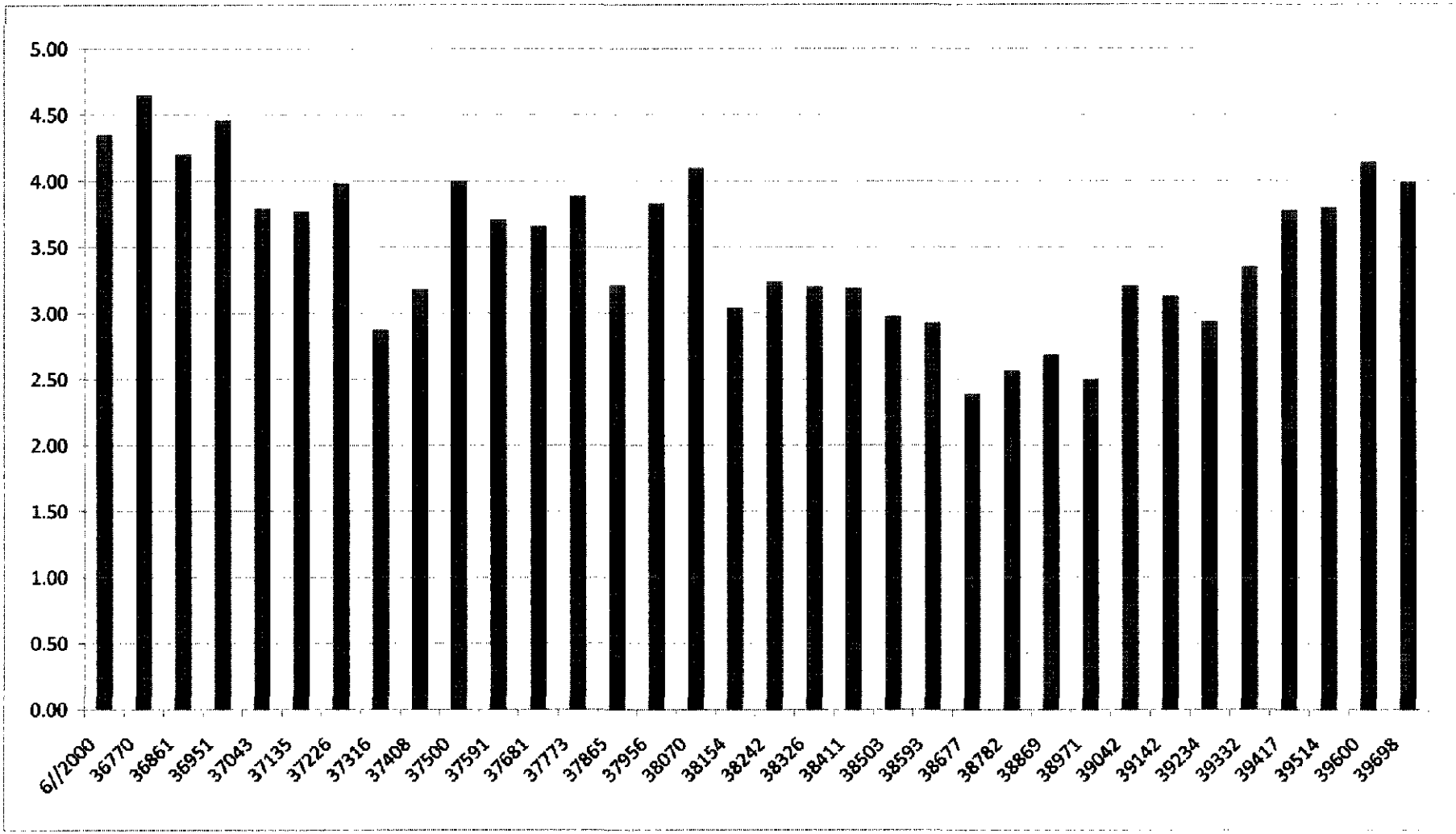

Data Source: Morningstar, *SBBI Yearbook*, 2008.

## Growth Rates
### GNP, S&P 500 Price, EPS, and DPS

| | GDP | S&P 500 | Earnings | Dividends | |
|---|---|---|---|---|---|
| 1960 | 526.4 | 58.11 | 3.10 | 1.98 | |
| 1961 | 544.7 | 71.55 | 3.37 | 2.04 | |
| 1962 | 585.6 | 63.1 | 3.67 | 2.15 | |
| 1963 | 617.7 | 75.02 | 4.13 | 2.35 | |
| 1964 | 663.6 | 84.75 | 4.76 | 2.58 | |
| 1965 | 719.1 | 92.43 | 5.30 | 2.83 | |
| 1966 | 787.8 | 80.33 | 5.41 | 2.88 | |
| 1967 | 832.6 | 96.47 | 5.46 | 2.98 | |
| 1968 | 910.0 | 103.86 | 5.72 | 3.04 | |
| 1969 | 984.6 | 92.06 | 6.10 | 3.24 | |
| 1970 | 1038.5 | 92.15 | 5.51 | 3.19 | |
| 1971 | 1127.1 | 102.09 | 5.57 | 3.16 | |
| 1972 | 1238.3 | 118.05 | 6.17 | 3.19 | |
| 1973 | 1382.7 | 97.55 | 7.96 | 3.61 | |
| 1974 | 1500.0 | 68.56 | 9.35 | 3.72 | |
| 1975 | 1638.3 | 90.19 | 7.71 | 3.73 | |
| 1976 | 1825.3 | 107.46 | 9.75 | 4.22 | |
| 1977 | 2030.9 | 95.1 | 10.87 | 4.86 | |
| 1978 | 2294.7 | 96.11 | 11.64 | 5.18 | |
| 1979 | 2563.3 | 107.94 | 14.55 | 5.97 | |
| 1980 | 2789.5 | 135.76 | 14.99 | 6.44 | |
| 1981 | 3128.4 | 122.55 | 15.18 | 6.83 | |
| 1982 | 3255.0 | 140.64 | 13.82 | 6.93 | |
| 1983 | 3536.7 | 164.93 | 13.29 | 7.12 | |
| 1984 | 3933.2 | 167.24 | 16.84 | 7.83 | |
| 1985 | 4220.3 | 211.28 | 15.68 | 8.20 | |
| 1986 | 4462.8 | 242.17 | 14.43 | 8.19 | |
| 1987 | 4739.5 | 247.08 | 16.04 | 9.17 | |
| 1988 | 5103.8 | 277.72 | 22.77 | 10.22 | |
| 1989 | 5484.4 | 353.4 | 24.03 | 11.73 | |
| 1990 | 5803.1 | 330.22 | 21.73 | 12.35 | |
| 1991 | 5995.9 | 417.09 | 19.10 | 12.97 | |
| 1992 | 6337.7 | 435.71 | 18.13 | 12.64 | |
| 1993 | 6657.4 | 466.45 | 19.82 | 12.69 | |
| 1994 | 7072.2 | 459.27 | 27.05 | 13.36 | |
| 1995 | 7397.7 | 615.93 | 35.35 | 14.17 | |
| 1996 | 7816.9 | 740.74 | 35.78 | 14.89 | |
| 1997 | 8304.3 | 970.43 | 39.56 | 15.52 | |
| 1998 | 8747.0 | 1229.23 | 38.23 | 16.20 | |
| 1999 | 9268.4 | 1469.25 | 45.17 | 16.71 | |
| 2000 | 9817.0 | 1320.28 | 52.00 | 16.27 | |
| 2001 | 10128.0 | 1148.09 | 44.23 | 15.74 | |
| 2002 | 10469.6 | 879.82 | 47.24 | 16.08 | |
| 2003 | 10960.8 | 1111.91 | 54.15 | 17.88 | |
| 2004 | 11685.9 | 1211.92 | 67.01 | 19.41 | |
| 2005 | 12433.9 | 1248.29 | 68.32 | 22.38 | **Average** |
| 2006 | 13194.7 | 1418.3 | 81.96 | 25.05 | |
| 2007 | 13843.0 | 1468.36 | 87.51 | 27.73 | |
| **Growth** | **7.20%** | **7.11%** | **7.36%** | **5.77%** | **6.86%** |

Data Sources: GDPA - http://research.stlouisfed.org/fred2/categories/106
S&P 500, EPS and DPS - http://pages.stern.nyu.edu/~adamodar/

## CFO's Equity Risk Premium
## 2000-2008



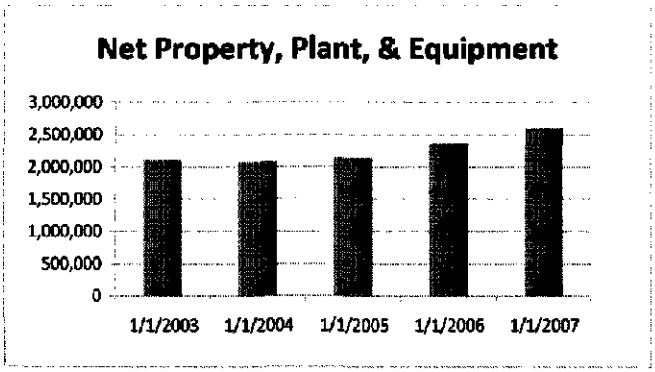

Data Source: John Graham and Campbell Harvey, "The Equity Risk Premium in 2008: Evidence from the Global CFO Outlook Survey."

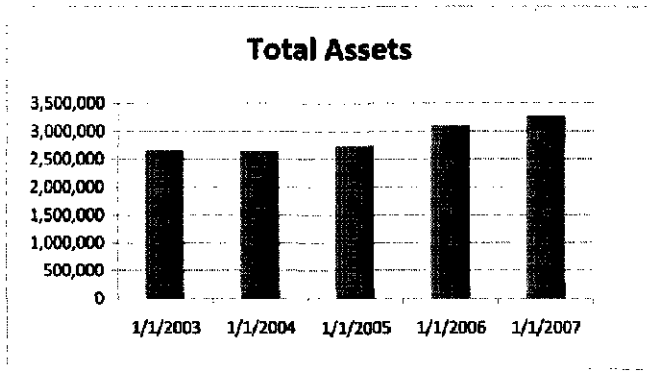
**Dayton Power & Light**
**Capitalization and Financial Statistics**

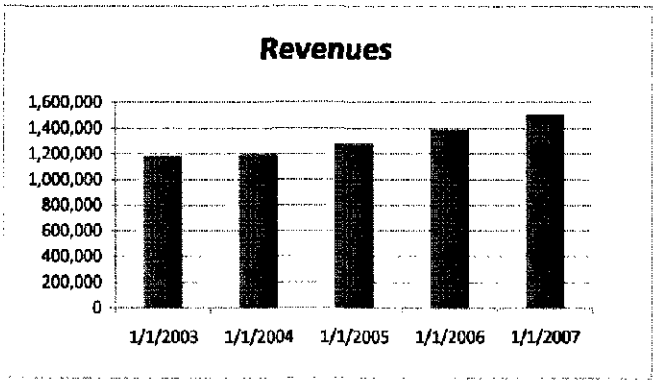
| | 12/31/07 | 12/31/06 | 12/31/05 | 12/31/04 | 12/31/03 |
|---|---|---|---|---|---|
| **Capital Structure** | | | | | |
| Long-term debt | 874,600.0 | 785,200.0 | 685,900.0 | 686,600.0 | 687,300.0 |
| Cumulative preferred stock | 22,900.0 | 22,900.0 | 22,900.0 | 22,900.0 | 22,900.0 |
| Total common shareholder's equity | 1,369,300.0 | 1,231,200.0 | 1,079,400.0 | 1,056,100.0 | 1,140,800.0 |
| Total Capital | 2,266,800.0 | 2,039,300.0 | 1,788,200.0 | 1,765,600.0 | 1,851,000.0 |
| | | | | | |
| Long-term debt | 38.58% | 38.50% | 38.36% | 38.89% | 37.13% |
| Cumulative preferred stock | 1.01% | 1.12% | 1.28% | 1.30% | 1.24% |
| Total common shareholder's equity | 60.41% | 60.37% | 60.36% | 59.82% | 61.63% |
| Total Capital | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| | | | | | |
| **Financial Statistics** | | | | | |
| Operating Margin | 29.06% | 29.96% | 30.98% | 33.36% | 37.11% |
| Net Profit Margin | 17.50% | 16.59% | 17.53% | 20.23% | 20.71% |
| Pre-Tax Interest Coverage | 17.20 | 10.04 | 8.49 | 7.62 | 8.16 |
| | | | | | |
| Return on Assets | 7.84% | 7.73% | 7.91% | 9.00% | 9.16% |
| Asset Turnover | 0.45 | 0.47 | 0.45 | 0.44 | 0.44 |
| Leverage | 2.39 | 2.51 | 2.54 | 2.50 | 2.33 |
| Return on Average Equity | 20.89% | 20.98% | 19.84% | 19.03% | 20.73% |

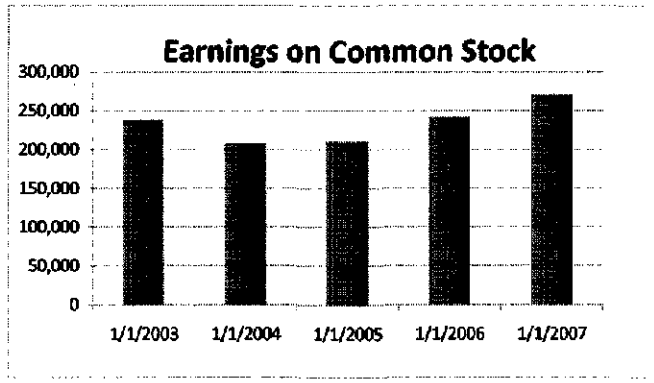
Data: Company financial statements

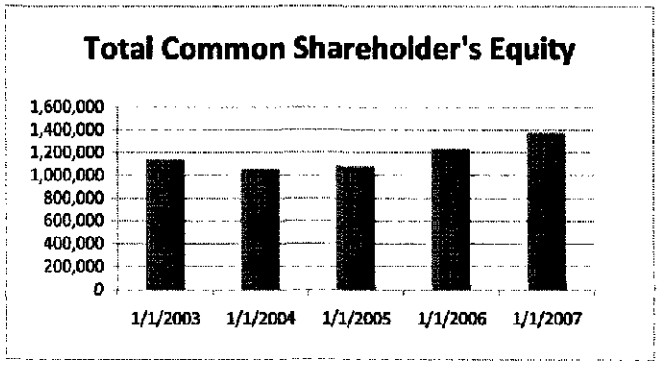
**Dayton Power & Light**
**Financial Performance**

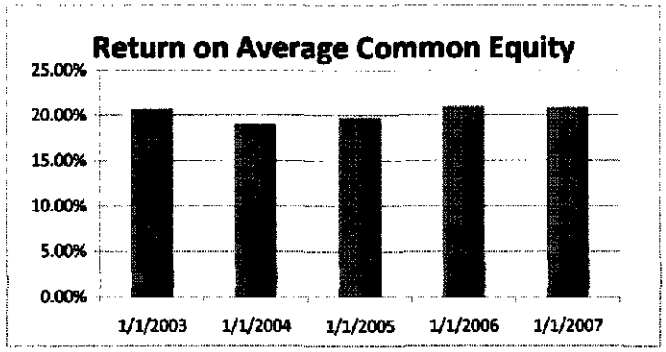


# Appendix A
## Educational Background, Research, and Related Business Experience
## J. Randall Woolridge

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room and President and CEO of the Nittany Lion Fund, LLC.

Professor Woolridge received a Bachelor of Arts degree in Economics from the University of North Carolina, a Master of Business Administration degree from the Pennsylvania State University, and a Doctor of Philosophy degree in Business Administration (major area-finance, minor area-statistics) from the University of Iowa. At Iowa he received a Graduate Fellowship and was awarded membership in Beta Gamma Sigma, a national business honorary society. He has taught Finance courses at the University of Iowa, Cornell College, and the University of Pittsburgh, as well as the Pennsylvania State University. These courses include corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on the theoretical and empirical foundations of corporation finance and financial markets and institutions. He has published over 35 articles in the best academic and professional journals in the field, including the *Journal of Finance*, the *Journal of Financial Economics*, and the *Harvard Business Review*. His research has been cited extensively in the business press. His work has been featured in the *New York Times*, *Forbes*, *Fortune*, *The Economist*, *Financial World*, *Barron's*, *Wall Street Journal*, *Business Week*, *Washington Post*, *Investors' Business Daily*, *Worth Magazine*, *USA Today*, and other publications. In addition, Dr. Woolridge has appeared as a guest to discuss the implications of his research on CNN's *Money Line*, CNBC's *Morning Call* and *Business Today*, and Bloomberg Televisions' *Morning Call*.

Professor Woolridge's popular stock valuation book, *The StreetSmart Guide to Valuing a Stock* (McGraw-Hill, 2003), was released in its second edition. He has also co-authored *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation, 1999) as well as a new textbook entitled *Applied Principles of Finance* (Kendall Hunt, 2006). Dr. Woolridge is a founder and a managing director of www.valuepro.net - a stock valuation website.

Professor Woolridge has also consulted with and prepared research reports for major corporations, financial institutions, and investment banking firms, and government agencies. In addition, he has directed and participated in over 500 university- and company- sponsored professional development programs for executives in 25 countries in North and South America, Europe, Asia, and Africa.

Dr. Woolridge has prepared testimony and/or provided consultation services in the following cases:

**Pennsylvania**: Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Pennsylvania Public Utility Commission; Bell Telephone Company (R-811819), Peoples Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company (R-832381), Pennsylvania Power Company (R-842740), Pennsylvania Gas and Water Company (R-850178), Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas of Pennsylvania, Inc. (R-901873), National Fuel Gas Corporation (R-911912), Pennsylvania-American Water Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc, (R-932604), National Fuel Gas Corporation (R-932548), Commonwealth Telephone Company (I-

920020), Conestoga Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain Consolidated Water Company (R-932873), National Fuel Gas Corporation (R-942991), UGI - Gas Division (R-953297), UGI - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American Water Company (R-994638), Philadelphia Suburban Water Company (R-994868;R-994877;R-994878; R-9948790), Philadelphia Suburban Water Company (R-994868), Wellsboro Electric Company (R-00016356), Philadelphia Suburban Water Company (R-00016750), National Fuel Gas Corporation (R-00038168), Pennsylvania-American Water Company (R-00038304), York Water Company (R-00049165), Valley Energy Company (R-00049345), Wellsboro Electric Company (R-00049313), National Fuel Gas Corporation (R-00049656), T.W. Phillips Gas and Oil Co. (R-00051178), PG Energy (R-00061365), City of Dubois Water Company (Docket No. R-00050671), R-00049165), York Water Company (R-00061322), Emporium Water Company (R-00061297), Pennsylvania-American Water Company (R-00072229),

**New Jersey:** Dr. Woolridge prepared testimony for the New Jersey Department of the Public Advocate, Division of Rate Counsel: New Jersey-American Water Company (R-91081399J), New Jersey-American Water Company (R-92090908J), and Environmental Disposal Corp. (R-94070319).

**Alaska:** Dr. Woolridge prepared testimony for Attorney General's Office of Alaska: Golden Heart Utilities, Inc. and College Utilities Corp. (Water Public Utility Service TA-29-118 and Sewer Public Utility Service TA-82-97), Anchorage Water and Wastewater Utility (TA-106-122).

**Arizona:** Dr. Woolridge prepared testimony for Utility Division staff of the Arizona Corporation Commission, Arizona Public Service Company (Docket No. E-01345A-06-0009).

**Hawaii:** Dr. Woolridge prepared testimony for the Hawaii Office of the Consumer Advocate: East Honolulu Community Services, Inc. (Docket No. 7718).

**Delaware:** Dr. Woolridge prepared testimony for the Delaware Division of Public Advocate: Artesian Water Company (R-00-649). Dr. Woolridge prepared testimony for the staff of the Public Service Commission: Artesian Water Company (R-06-158).

**Ohio:** Dr. Woolridge prepared testimony for the Ohio Office of Consumers' Council: SBC Ohio (Case No. 02-1280-TP-UNC R-00-649), and Cincinnati Gas & Electric Company (Case No. 05-0059-EL-AIR).

**Texas:** Dr. Woolridge prepared testimony for the Atmos Cities Steering Committee: Mid-Texas Division of Atmos Energy Corp. (Docket No. 9670).

**New York:** Dr. Woolridge prepared testimony for the County of Nassau in New York State: Long Island Lighting Company (PSC Case No. 942354).

**Florida:** Dr. Woolridge prepared testimony for the Office of Public Counsel in Florida: Florida Power & Light Co. (Docket No. 050045-EL).

**Indiana:** Dr. Woolridge prepared testimony for the Indiana Office of Utility Consumer Counsel (OUCC) in the following cases: Southern Indiana Gas and Electric Company (IURC Cause No. 43111 and IURC Cause No. 43112).

**Oklahoma:** Dr. Woolridge prepared testimony for the Oklahoma Industrial Energy Companies (OIEC) in the following cases: Public Service Company of Oklahoma (Cause No. PUD 200600285), Oklahoma Gas & Electric Company (Cause No. PUD 200700012

Appendix A
Educational Background, Research, and Related Business Experience
J. Randall Woolridge

**Connecticut:** Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Connecticut: United Illuminating (Docket No. 96-03-29), Yankee Gas Company (Docket No. 04-06-01), Southern Connecticut Gas Company (Docket No. 03-03-17), the United Illuminating Company (Docket No. 05-06-04), Connecticut Light and Power Company (Docket No. 05-07-18), Birmingham Utilities, Inc. (Docket No. 06-05-10), Connecticut Water Company (Docket No. 06-07-08), Connecticut Natural Gas Corp. (Docket No. 06-03-04), Aquarion Water Company (Docket No. 07-05-09), Yankee Gas Company (Docket No. 06-12-02), and Connecticut Light and Power Company (Docket No. 07-07-01).

**California:** Dr. Woolridge prepared testimony for the Office of Ratepayer Advocate in California: San Gabriel Valley Water Company (Docket No. 05-08-021), Pacific Gas & Electric (Docket No. 07-05-008), San Diego Gas & Electric (Docket No. 07-05-007), and Southern California Edison (Docket No. 07-05-003).

**South Carolina:** Dr. Woolridge prepared testimony for the Office of Regulatory Staff in South Carolina: South Carolina Electric and Gas Company (Docket No. 2005-113-G), Carolina Water Service Co. (Docket No. 2006-87-WS), Tega Cay Water Company (Docket No. 2006-97-WS), United Utilities Companies, Inc. (Docket No. 2006-107-WS).

**Missouri:** Dr. Woolridge prepared testimony for the Department of Energy in Missouri: Kansas City Power & Light Company (CASE NO. ER-2006-0314). Dr. Woolridge prepared testimony for the Office of Attorney General of Missouri: Union Electric Company (CASE NO. ER-2007-0002).

**Kentucky:** Dr. Woolridge prepared testimony for the Office of Attorney General in Kentucky: Kentucky-American Water Company (Case No. 2004-00103), Union Heat, Light, and Power Company (Case No. 2004-00042), Kentucky Power Company (Case No. 2005-00341), Union Heat, Light, and Power Company (Case No. 2006-00172), Atmos Energy Corp. (Case No. 2006-00464), Columbia Gas Company (Case No. 2007-00008), Delta Natural Gas Company (Case No. 2007-00089), Kentucky-American Water Company (Case No. 2007-00143).

**Washington, D.C.:** Dr. Woolridge prepared testimony for the Office of the People's Counsel in the District of Columbia: Potomac Electric Power Company (Formal Case No. 939).

**Washington:** Dr. Woolridge consulted with trial staff of the Washington Utilities and Transportation Commission on the following cases: Puget Energy Corp. (Docket Nos. UE-011570 and UG-011571); and Avista Corporation (Docket No. UE-011514).

**Kansas:** Dr. Woolridge prepared testimony on behalf of the Kansas Citizens' Utility Ratepayer Board in the following cases: Western Resources Inc. (Docket No. 01-WSRE-949-GIE), UtiliCorp (Docket No. 02-UTCG701-CIG), and Westar Energy, Inc. (Docket No. 05-WSEE-981-RTS).

**FERC:** Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Federal Energy Regulatory Commission: National Fuel Gas Supply Corporation (RP-92-73-000) and Columbia Gulf Transmission Company (RP97-52-000).
**Vermont:** Dr. Woolridge prepared testimony for the Department of Public Service in the Central Vermont Public Service (Docket No. 6988) and Vermont Gas Systems, Inc. (Docket No. 7160).