OCC EXHIBIT NO. _____

FILE

BEFORE

THE PUBLIC UTILITIES COMMISSION OF OHIO

In the Matter of the Application of Columbia Gas of Ohio, Inc. for Authority to Amend Filed Tariffs to Increase the Rates and Charges for Gas Distribution Services.	)	Case No. 08-72-GA-AIR
In the Matter of the Application of Columbia Gas of Ohio, Inc. for Approval of an Alternative Form of Regulation and for a Change in its Rates and Charges.	)	Case No. 08-0073-GA-ALT
In the Matter of the Application of Columbia Gas of Ohio, Inc. for Approval to Change Accounting Methods.	)	Case No. 08-0074-GA-AAM
In the Matter of the Application of Columbia Gas of Ohio, Inc. for Authority to Revise Its Depreciation Accrual Rates.	)	Case No. 08-0074-GA-AAM

DIRECT TESTIMONY
of
DR. J. RANDALL WOOLRIDGE, PhD.

ON BEHALF OF THE
OFFICE OF THE OHIO CONSUMERS' COUNSEL
10 West Broad St., Suite 1800
Columbus, OH 43215

September 25, 2008

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I. INTRODUCTION

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.

II. 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 Office of the Ohio Consumers' Counsel ("OCC") to provide an opinion as to the overall fair rate of return or cost of capital for Columbia Gas of Ohio, Inc. ("Columbia" or "Company") and to evaluate Columbia's rate of return testimony in this proceeding.

Q3. HOW IS YOUR TESTIMONY ORGANIZED?

A3. First I will review my cost of capital recommendation for Columbia, and review the primary areas of contention between Columbia's rate of return position and OCC. Second, I provide an assessment of the capital costs in today's capital markets.

Third, I discuss my proxy group of gas distribution companies for estimating the cost of capital for Columbia. 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 Columbia. Sixth, I critique the Company's rate of return analysis and testimony. Finally, I present a critical analysis of the Staff Report.[1]

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

A4. My analysis suggests that the Company's proposed capital structure is consistent with the average capital structure ratios of my proxy group of gas distribution companies. I have used Columbia's long-term debt cost rate. I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to a proxy group of publicly-held gas distribution companies ("Gas Proxy Group"). My analysis indicates that an equity cost rate of 9.00% is appropriate for the Company. Using my capital structure and debt and equity cost rates, I estimate an overall cost of capital of 7.37% for Columbia. These findings are summarized in Exhibit JRW-1. This recommendation includes a 25 basis point downward adjustment to reflect the Company's proposed Straight Fixed Variable rate design and Infrastructure Replacement Program rider. As discussed later in my testimony, I recommend that a downward adjustment be made to the

[1] *A Report by the Staff of the Public Utilities Commission of Ohio, Columbia Gas of Ohio, Inc.* Case No. 08-72-GA-AIR ("Staff Report") (August 21, 2008).

authorized return on equity if these ratemaking mechanisms are approved by the Commission.

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

A5. Columbia witness Paul R. Moul provides the Company's proposed capital structure, long-term debt cost rate, and common equity cost rate. My analysis suggests that the Company's recommended capital structure is reasonable. I differ from the Company in that I use the long-term debt cost rate of Columbia and not of Columbia's parent company, NiSource, Inc. Nonetheless the primary area of contention in this case is the proposed equity cost rate for Columbia. Mr. Moul's equity cost rate estimate is 11.50%, whereas my analysis indicates an equity cost rate before adjustment of 9.25% is appropriate for Columbia.

Both Mr. Moul and I have applied the DCF and the CAPM approaches to groups of publicly-held gas distribution companies. Mr. Moul has also used Risk Premium ("RP") and Comparable Earnings ("CE") approaches to estimate an equity cost rate for Columbia. As discussed in my testimony, my equity cost rate recommendation is consistent with the current economic environment. Long-term capital costs are at historical low levels. The yields on long-term Treasury bonds have been in the 4-5 percent range for several years. Prior to this cyclical decline in rates in 2002, these yields had not been this low over an extended period of time since the 1960s. Long-term capital costs are also low due to the decline in

the equity risk premium and the Jobs and Growth Tax Relief Reconciliation Act of 2003, which reduced the tax rates on dividend income and capital gains.

Mr. Moul believes that the DCF model produces equity cost rate results that are too low. He especially believes this is true for gas distribution companies, and consequently, he has elected to also use the equity cost rate results for an inappropriate group of combination electric and gas companies. On the other hand, I believe that the DCF model provides a good indication of equity cost rates for public utilities and have relied on these results in this proceeding. With respect to the specifics of the DCF model, the major areas of disagreement include the DCF dividend yield adjustment and growth rate as well as Mr. Moul's adjustments for leverage and flotation costs. Mr. Moul adjusts his DCF dividend yield because he believes that the yield must be adjusted to account for the quarterly payment of dividends. I demonstrate that this is not necessary. Mr. Moul relies exclusively on analysts EPS growth rate forecasts for his DCF growth rate. I demonstrate that there is a well-known upward bias to these growth rate forecasts. Mr. Moul's adjustment for leverage and flotation costs are unwarranted and simply serve to inflate his DCF equity cost rate.

The CAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. Mr. Moul's betas and equity risk premiums are excessive and do not reflect current market fundamentals. He makes an unnecessary leverage adjustment to his betas, which is similar in concept to his adjustment to

his DCF equity cost rate, as well as an erroneous flotation cost adjustment. The equity risk premium in Mr. Moul's CAPM is the average of a historic and a projected equity risk premium. 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 addition, Mr. Moul's projected equity risk premium, which uses analysts' projections, employs unrealistic assumptions regarding future economic and earnings growth and stock returns. I use an equity risk premium 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) that result from surveys of financial forecasters and corporate CFOs.

Mr. Moul and I also disagree on the need for a size premium adjustment to the CAPM. The size premium is based on historical stock returns, and as discussed in my testimony, there are a number of errors in using historical market returns to compute risk premiums. In addition, I will show that any equity cost rate adjustment based on the relative size of a public utility is inappropriate.

Mr. Moul's RP and CE approaches are subject to a number of errors and therefore, do not provide reliable estimates of the Company's cost of equity capital. His RP

approach employs historic bond and stocks returns which, as indicated above, are not reliable measures of expected returns. On the other hand, the CE methodology, which is not market-based, has not been used by regulatory commissions for years as an equity cost rate approach.

Finally, Mr. Moul has not made any downward adjustments to his proposed return on equity for the Company to reflect the risk-reducing ratemaking mechanisms proposed by the Company. These include the Company's proposed Straight Fixed Variable rate design and Infrastructure Replacement Program rider.

In the end, the most significant areas of disagreement between Mr. Moul and me with respect to the estimation of a an equity cost rate for Columbia are: (1) the proxy group of combination gas and electric companies used by Mr. Moul, (2) the appropriate DCF growth rate, as well as relevance of the DCF model and its results in determining an equity cost rate for the Company; (3) the measurement and magnitude of the risk premium which is used in CAPM and RP methodologies; (4) the adjustments for leverage, size and flotation costs made by Mr. Moul, and (4) Mr. Moul's lack of an adjustment for the Company's proposed Straight Fixed Variable rate design and Infrastructure Replacement Program rider.

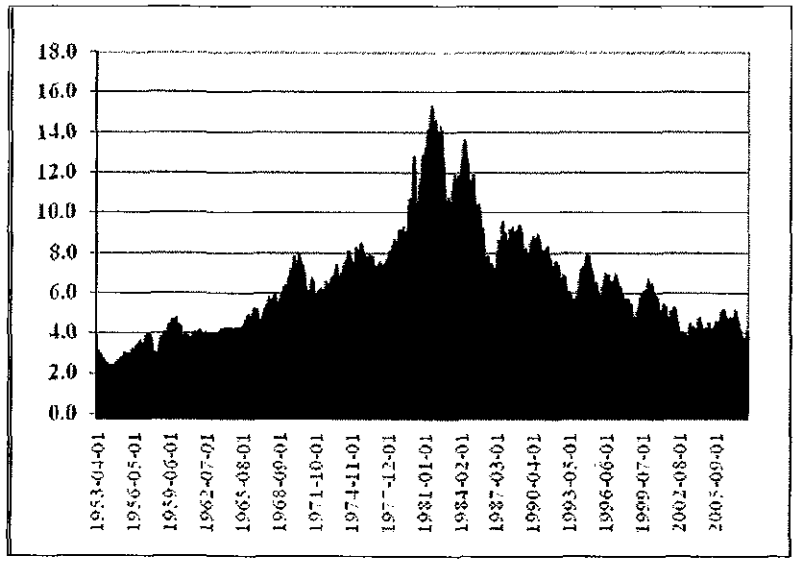
III. CAPITAL COSTS IN TODAY'S MARKETS

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

A6. Long-term capital cost rates for U.S. corporations are currently 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 the graph below 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.

Yields on Ten-Year Treasury Bonds

1953-Present



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

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 as shown on page 3 of Exhibit JRW-7. 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."[2] 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

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

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.

Alan Greenspan, the former Chairman of the Federal Reserve Board, indicated in an October 14, 1999, speech on financial risk that the fact that equity risk premiums have declined during the past decade is "not in dispute." His assessment focused on the relationship between information availability and equity risk premiums.

There can be little doubt that the dramatic improvements in information technology in recent years have altered our approach to risk. Some analysts perceive that information technology has permanently lowered equity premiums and, hence, permanently raised the prices of the collateral that underlies all financial assets.

The reason, of course, is that information is critical to the evaluation of risk. The less that is known about the current state of a market or a venture, the less the ability to project future outcomes and, hence, the more those potential outcomes will be discounted.

The rise in the availability of real-time information has reduced the uncertainties and thereby lowered the variances that we employ to guide portfolio decisions. At least part of the observed fall in

equity premiums in our economy and others over the past five years does not appear to be the result of ephemeral changes in perceptions. It is presumably the result of a permanent technology-driven increase in information availability, which by definition reduces uncertainty and therefore risk premiums. This decline is most evident in equity risk premiums. It is less clear in the corporate bond market, where relative supplies of corporate and Treasury bonds and other factors we cannot easily identify have outweighed the effects of more readily available information about borrowers.[3]

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. In addition, the 2003 tax law further lowered capital cost rates for companies, as further set forth below.

Q7. HOW DID THE JOBS AND GROWTH TAX RELIEF RECONCILIATION ACT OF 2003 REDUCE THE COST OF CAPITAL FOR COMPANIES?

A7. On May 28, 2003, President Bush signed the Jobs and Growth Tax Relief Reconciliation Act of 2003 ("2003 Tax Law"). The primary purpose of this legislation was to reduce taxes to enhance economic growth. A primary

[3] Alan Greenspan, "Measuring Financial Risk in the Twenty-First Century," Office of the Comptroller of the Currency Conference, October 14, 1999.

component of the new tax law was a significant reduction in the taxation of corporate dividends for individuals. Dividends have been described as "double-taxed." First, corporations pay taxes on the income they earn before they pay dividends to investors, then investors pay taxes on the dividends that they receive from corporations. One of the implications of the double taxation of dividends is that, all else equal, it results in a higher cost of raising capital for corporations. The tax legislation reduced the effect of double taxation of dividends by lowering the tax rate on dividends from the 30 percent range (the average tax bracket for individuals) to 15 percent.

Overall, the 2003 Tax Law reduced the pre-tax return requirements of investors, thereby reducing corporations' cost of equity capital. This is because the reduction in the taxation of dividends for individuals enhances their after-tax returns and thereby reduces their pre-tax required returns. This reduction in pre-tax required returns (due to the lower tax on dividends) effectively reduces the cost of equity capital for companies. The 2003 Tax Law also reduced the tax rate on long-term capital gains from 20% to 15%. The magnitude of the reduction in corporate equity cost rates could be as large as 100 basis points.

IV. COMPARISON GROUP SELECTION

Q8. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR COLUMBIA.

A8. To develop a fair rate of return recommendation for Columbia, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held gas distribution companies.

Q9. PLEASE DESCRIBE YOUR PROXY GROUP OF GAS DISTRIBUTION COMPANIES.

A9. My group ("Gas Proxy Group") consists of ten natural gas distribution companies covered by the Standard Edition of the *Value Line Investment Survey*. These companies include AGL Resource, Atmos Energy, Laclede Group, New Jersey Resources, Nicor, Inc., Northwest Natural Gas Company, Piedmont Natural Gas Company, South Jersey Industries, Southwest Gas, and EGL Holdings.

Summary financial statistics for the proxy group are listed in Exhibit JRW-2. The average operating revenues, net plant, and market capitalization for the Gas Proxy Group are $2,671.7M, $2,176.7M, and $1.5B, respectively. On average, the group receives 68% of revenues from regulated gas operations, has an 'A' S&P bond rating, a common equity ratio of 53%, and an earned return on common equity of 11.2%.

V. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q10. PLEASE DISCUSS THE RECOMMENDED CAPITAL STRUCTURE OF THE COMPANY.

A10. The Company's recommended capital structure is shown in Panel A of page 1 of Exhibit JRW-3. This capital structure is for test year-end as of December 31, 2007. The recommended capital structure has a common equity ratio of 49.46%.

Panel B of page 1 of Exhibit JRW-3 provides the average capital structure ratios for the ten gas companies in the Gas Proxy Group over the four quarters ending December 31, 2007. The average common equity ratio, including short-term debt, is 51.39%. Given the similar common equity ratios of the Gas Proxy Group and Columbia, I will adopt Mr. Moul's recommended capital structure.

Q11. ARE YOU ALSO ADOPTING THE COMPANY'S LONG-TERM DEBT COST RATE OF 6.79%?

A11. No. As indicated in Schedule D, Columbia's embedded long-term debt cost rate is 5.78%. I will use this as my long-term debt cost rate for the Company. The Company's proposed long-term debt cost rate of 6.79% is that of NiSource Inc. and reflects the financing costs of overall business activities. As such, it is not appropriate as a long-term debt cost rate for Columbia.

VI. THE COST OF COMMON EQUITY CAPITAL

A. Overview

Q12. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN BE ESTABLISHED FOR A PUBLIC UTILITY?

A12. 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).

Q13. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE CONTEXT OF THE THEORY OF THE FIRM.

A13. 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 is 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:[4]

> 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

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

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.

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.

Q14. PLEASE PROVIDE ADDITIONAL INSIGHTS INTO THE RELATIONSHIP BETWEEN RETURN ON EQUITY AND MARKET-TO-BOOK RATIOS.

A14. 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:[5]

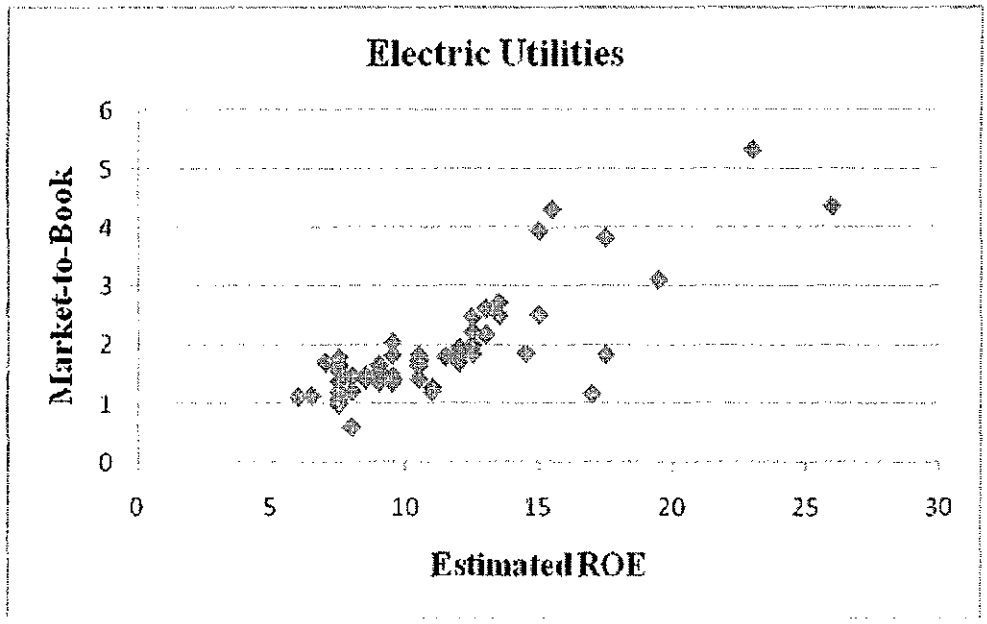
> For a given industry, more profitable firms – those able to generate higher returns per dollar of equity – should have higher market-to-book ratios. Conversely, firms which are unable to generate returns in excess of their cost of equity should sell for less than book value.

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

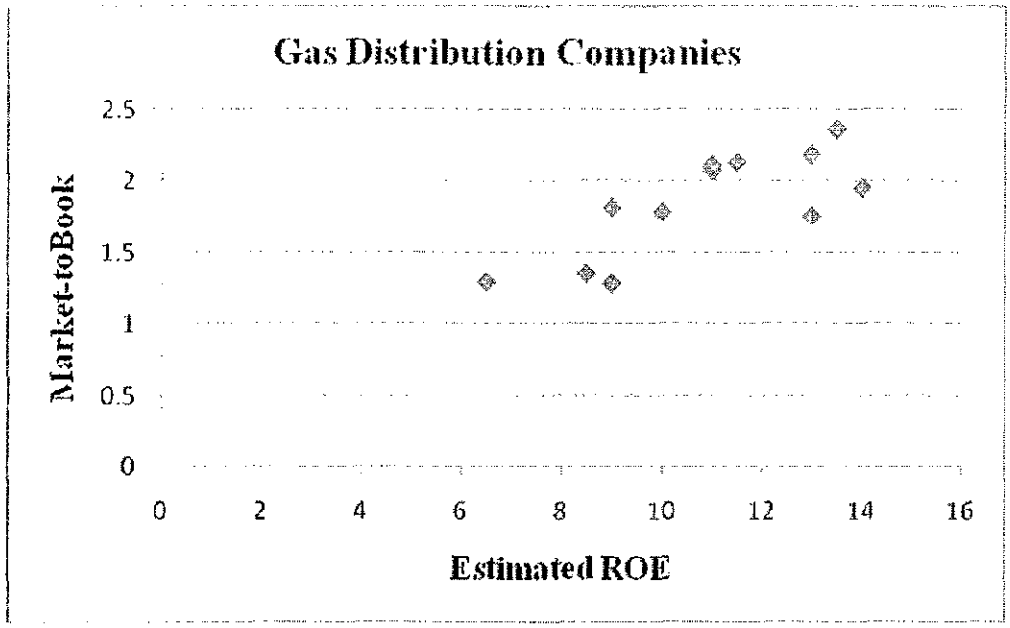
Profitability	***Value***
If ROE > K	***then Market/Book > 1***
If ROE = K	***then Market/Book =1***
If ROE < K	***then Market/Book < 1***

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 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 below.

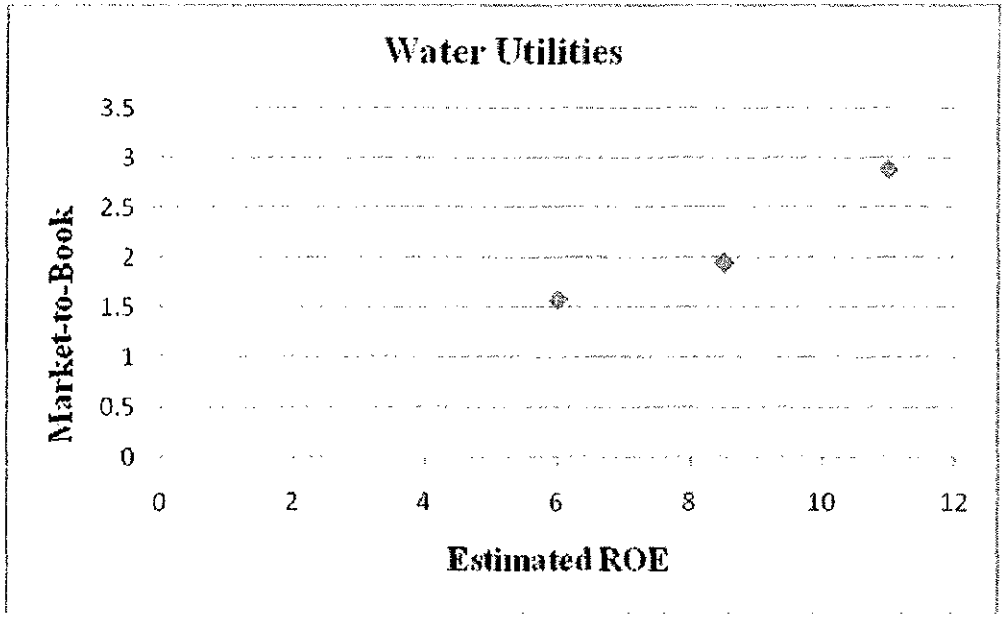
The Relationship Between Estimated ROE and Market-to-Book Ratios
Value Line Electrics, Gas Distribution Companies, and Water Utilities



R-Square = .65
N=56



R-Square = .60
N=12



R-Square = .92
N=4

The average R-squares for the electric, gas, and water companies are 0.65, 0.60, and 0.92.[6] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities.

Q15. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY CAPITAL FOR PUBLIC UTILITIES?

A15. Exhibit JRW-4 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, of 2006, declined and then once again increased to over 6.0% in the summer of 2007. They have since retreated to the 5.50% range. 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%.

Average earned returns on common equity and market-to-book ratios are given on page 3 of Exhibit JRW-4. 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

[6] 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.

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-4, coupled with the overall decrease in interest rates, suggest that capital costs for the Dow Jones Utilities have decreased over the past decade.

Q16. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED RATE OF RETURN ON EQUITY?

A16. 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.

Q17. HOW DOES THE INVESTMENT RISK OF GAS DISTRIBUTION COMPANIES COMPARE WITH THAT OF OTHER INDUSTRIES?

A17. 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-5 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 that need be of concern for investors. These betas come from the *Value Line Investment Survey* and are compiled by Aswath Damodoran of New York University.[7] The study shows that the investment risk of public utilities is relatively low. The average beta for gas distribution companies of 0.78 is in the bottom ten percent of all industries and well below the *Value Line* average of 1.24. As such, the cost of equity for the gas distribution industry is among the lowest of all industries in the U.S.

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

Q18. HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON EQUITY CAPITAL BE DETERMINED?

A18. 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, reflects 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.

Q19. HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR THE COMPANY?

A19. 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

Q20. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.

A20. 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:

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

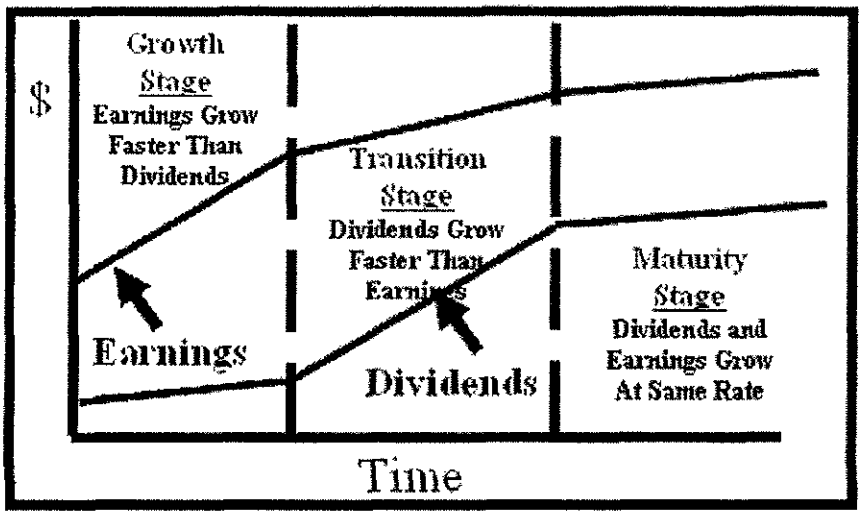
where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

Q21. IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?

A21. 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 discussed below. 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. These stages are depicted in the graphic below labeled the Three-Stage DCF Model.[8]

[8] This description comes from William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 1995), pp. 590-91.

Three-Stage DCF Model



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.

Q22. HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED RATE OF RETURN USING THE DCF MODEL?

A22. 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:

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

Q23. IN YOUR OPINION, IS THE CONSTANT-GROWTH DCF MODEL APPROPRIATE FOR PUBLIC UTILITIES?

A23. 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.

Q24. WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF METHODOLOGY?

A24. 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.

Q25. PLEASE DISCUSS EXHIBIT JRW-6.

A25. My DCF analysis is provided in Exhibit JRW-6. 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.

Q26. WHAT DIVIDEND YIELDS ARE YOU EMPLOYING IN YOUR DCF ANALYSIS FOR THE PROXY GROUP?

A26. The dividend yields on the common stock for the companies in the proxy group are provided on page 2 of Exhibit JRW-6 for the six-month period ending September 2008. For the DCF dividend yields for the group, I am using the average of the six month and September 2008 dividend yields. The table below shows these dividend yields.

Proxy Group	6-Month Average Dividend Yield	September 2008 Dividend Yield	DCF Dividend Yield
Gas Proxy Group	4.2%	3.8%	4.0%

Q27. PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT DIVIDEND YIELD.

A27. 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.[9]

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.

The appropriate adjustment to the dividend yield is further complicated in the regulatory process when the overall cost of capital is applied to a projected rate base. The net effect of this application is an overstatement of the equity cost rate estimate derived from the DCF model. In the context of the constant-growth DCF model, both the adjusted dividend yield and the growth component are overstated. The overstatement results from applying an equity cost rate computed using current market data to a future or test-year-end rate base which includes growth associated with the retention of earnings during the year. In other words, an

[9] *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).

equity cost rate times a future, yet to be achieved rate base, results in an inflated dividend yield and growth rate.

Q28. GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE FOR YOUR DIVIDEND YIELD?

A28. I will adjust the dividend yield by one-half (1/2) the expected growth so as to reflect growth over the coming year.

Q29. PLEASE DISCUSS THE GROWTH RATE COMPONENT OF THE DCF MODEL.

A29. 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' expectations 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.

Q30. WHAT GROWTH DATA HAVE YOU REVIEWED FOR THE PROXY GROUP?

A30. 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 Zacks and First Call. These services solicit five-year earnings growth rate projections from securities analysts and compile and publish the averages of these forecasts on the Internet. Finally, I have also assessed prospective growth as measured by prospective earnings retention rates and earned returns on common equity.

Q31. PLEASE DISCUSS HISTORICAL GROWTH IN EARNINGS AND DIVIDENDS AS WELL AS INTERNAL GROWTH.

A31. 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.

Q32. 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?

A32. 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 my critique of the Company's testimony.

Q33. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE GROUP AS PROVIDED IN THE VALUE LINE INVESTMENT SURVEY.

A33. 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-6. Due to the presence of outliers among the historic growth rate figures, both the mean and medians are used in the analysis.[10] The historical growth measures in EPS, DPS, and BVPS for the Gas Proxy Group, as measured by the means and medians, range from 1.8% to 7.3%, with an average of 4.5%.

Q34. PLEASE SUMMARIZE VALUE LINE'S PROJECTED GROWTH RATES FOR THE COMPANIES IN THE PROXY GROUP.

A34. *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-6. As above, due to the presence of outliers, both the mean and medians are used in the analysis. For the Gas Proxy Group, the central tendency measures range from 3.6% to 5.7%, with an average of 4.5%.

Also provided on page 4 of Exhibit JRW-6 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

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

primary driver of long-run earnings growth. For the Gas Proxy Group, the average prospective internal growth rate is 5.7%.

Q35. PLEASE ASSESS GROWTH FOR THE PROXY GROUP AS MEASURED BY ANALYSTS' FORECASTS OF EXPECTED 5-YEAR EPS GROWTH.

A35. Zacks and Reuters 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-6. The average of the mean and median analysts' projected EPS growth rates for the Gas Proxy Group is 5.9%.[11]

Q36. PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORICAL AND PROSPECTIVE GROWTH OF THE PROXY GROUP.

A36. The table below shows the summary DCF growth rate indicators for the proxy groups.

DCF Growth Rate Indicators

Growth Rate Indicator	Gas Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	**4.5%**
Projected *Value Line* Growth in EPS, DPS, and BVPS	**4.5%**
Internal Growth ROE * Retention rate	**5.7%**
Projected EPS Growth from First Call, Reuters, and Zacks	**5.9%**

[11] 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.

The average of the growth rate indicators is 5.15%. Giving greater weight to the projected growth rate indicators, an expected DCF growth rate in the 5.5% range is reasonable for the group.

Q37. BASED ON THE ABOVE ANALYSIS, WHAT ARE YOUR INDICATED COMMON EQUITY COST RATES FROM THE DCF MODEL FOR THE GROUP?

A37. My DCF-derived equity cost rate for the group is:

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

DCF Equity Cost Rates

	Gas Proxy Group
Dividend Yield	**4.0%**
1 + (½ Growth Rate Adjustment)	**1.0275**
DCF Growth Rate	**5.50%**
Equity Cost Rate	**9.6%**

These results are summarized on page 1 of Exhibit JRW-6.

C. Capital Asset Pricing Model Results

Q38. PLEASE DISCUSS THE CAPITAL ASSET PRICING MODEL ("CAPM").

A38. 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:

$$K = (R_f) + \beta * [E(R_m) - (R_f)]$$

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*—(β) 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: 1) the risk-free rate of interest (R_f), 2) the beta (ß), and 3) 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.

Q39. PLEASE DISCUSS EXHIBIT JRW-7.

A39. Exhibit JRW-7 provides the summary results for my CAPM study. Page 1 shows the results, and pages 2-5 contain the supporting data.

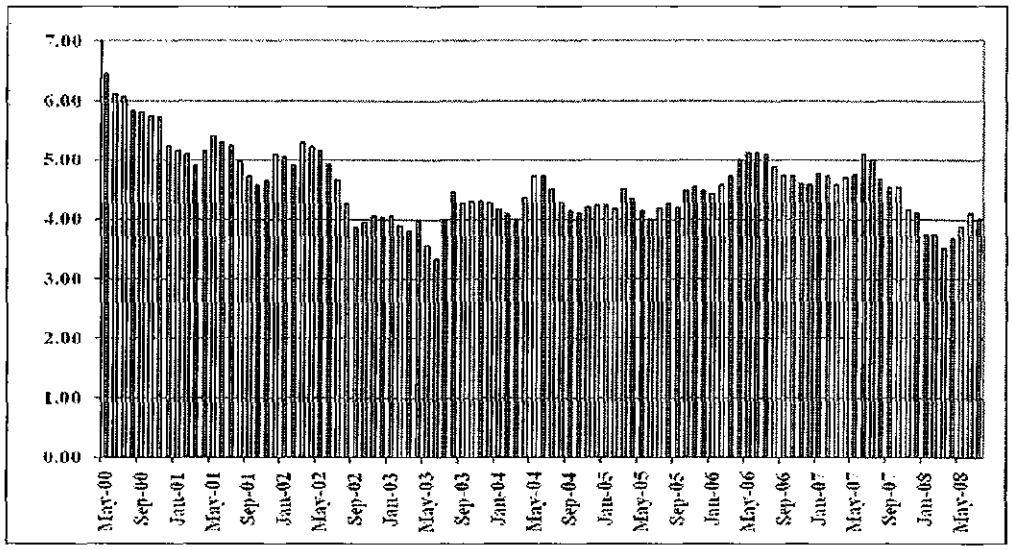
Q40. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A40. 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 in the chart below. 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, the effects of the housing and sub-prime mortgage issues that surfaced in the summer of 2007 have led to concerns about a slowdown in the economy, causing ten-year Treasury yields to once again fall below 4.0 percent.

Ten-Year U.S. Treasury Yields

January 2000-July 2008



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

Q41. WHAT RISK-FREE INTEREST RATE ARE YOU USING IN YOUR CAPM?

A41. 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 decreased to below 5.0% in response to the sub-prime mortgage and housing concerns. As of September 2, 2008, as shown in the table below, the rates on 10- and 30- U.S. Treasury Bonds were 3.74% and 4.37%, respectively. Given this recent range and recent downward movement, I will use 4.5% as the risk-free rate, or R_f, in my CAPM.

U.S. Treasury Yields

September 2, 2008

U.S. Treasuries

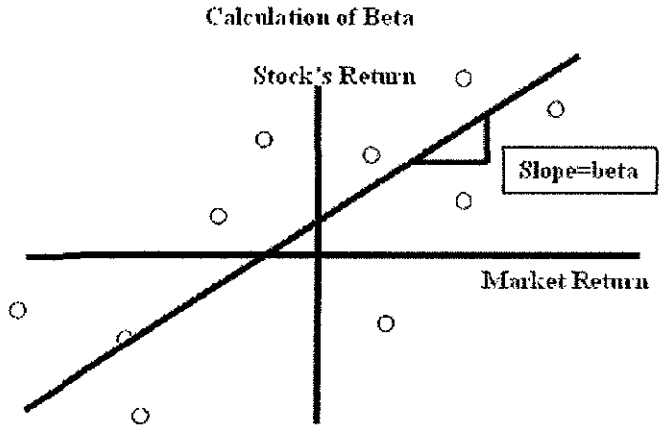
	COUPON	MATURITY DATE	CURRENT PRICE/YIELD
3-MONTH	0.000	11/28/2008	1.66 / 1.69
6-MONTH	0.000	02/26/2009	1.88 / 1.92
12-MONTH	0.000	08/27/2009	2.06 / 2.12
2-YEAR	2.375	08/31/2010	100-06+ / 2.27
3-YEAR	4.625	08/31/2011	106-00+ / 2.52
5-YEAR	3.125	08/31/2013	100-19+ / 2.99
10-YEAR	4.000	08/15/2018	102-04 / 3.74
30-YEAR	4.500	05/15/2038	102-07 / 4.37

Source: www.bloomberg.com

Q42. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

A42. 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 in the following:



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. Usually these services 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 groups, I am using the betas for the companies as provided in the *Value*

Line Investment Survey. As shown on page 2 of Exhibit JRW-7, the average beta for the companies in the Gas Proxy Group is 0.82.

Q43. PLEASE DISCUSS THE OPPOSING VIEWS REGARDING THE EQUITY RISK PREMIUM.

A43. 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.

Q44. PLEASE DISCUSS THE ALTERNATIVE APPROACHES TO ESTIMATING THE EQUITY RISK PREMIUM.

A44. The table below 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.

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. 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. 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).

The use of historical returns as market expectations has been criticized in numerous academic studies.[12] The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be

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

justified by the fundamental data. These studies, which fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using historical 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.[13]

Q45. PLEASE SUMMARIZE SOME OF THE ACADEMIC STUDIES THAT DEVELOP EX ANTE EQUITY RISK PREMIUMS.

A45. 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

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

ante expected equity risk premiums.[14] 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 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.[15] These authors compute ex ante expected

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

[15] 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).

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 increase when the required rate of return decreases. The higher stock prices have produced stock 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.

Q46. PLEASE PROVIDE A SUMMARY OF THE EQUITY RISK PREMIUM STUDIES.

A46. 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.[16] 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

[16] 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).

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 summary.

Page 3 of Exhibit JRW-7 provides a summary of the results of the primary risk premium studies reviewed by Derrig and Orr, Fernandez, and Song. In developing page 3 of Exhibit JRW-7, I have categorized the studies as discussed on page 44 of my testimony. I have also included the results of the "Building 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.

Q47. PLEASE DISCUSS YOUR DEVELOPMENT OF AN EQUITY RISK PREMIUM COMPUTED USING THE BUILDING BLOCKS METHODOLOGY.

A47. Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[17] They use 75 years of data and relate the compounded historical returns to the different fundamental

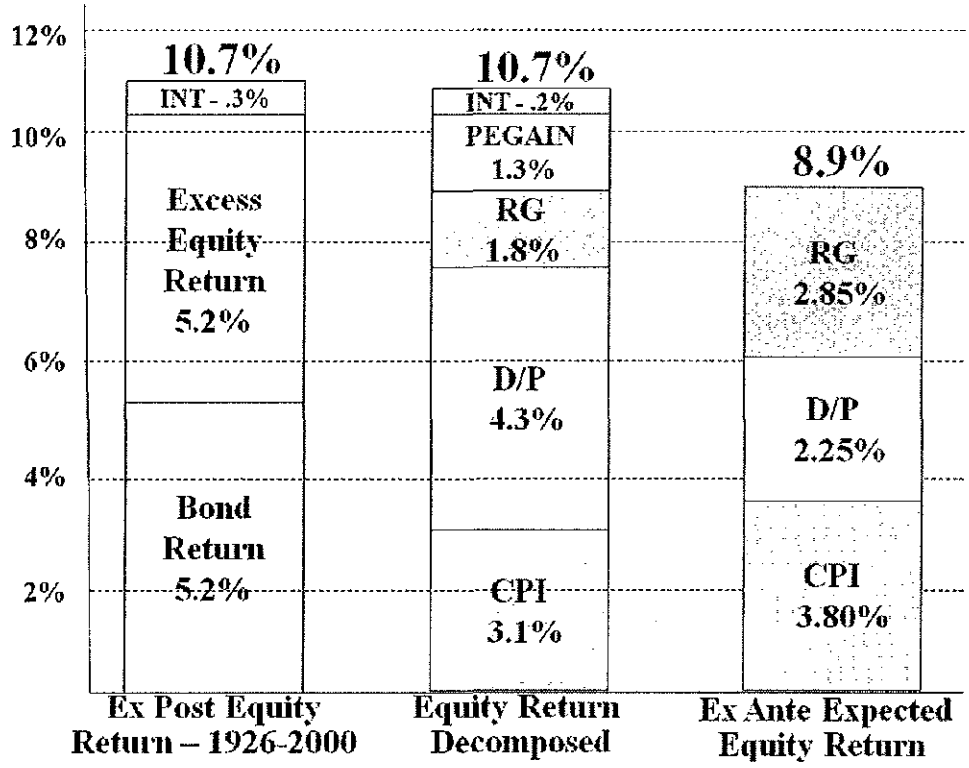
[17] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts Journal*, (January 2003).

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").[18] This is shown in the graph below. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return 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%).

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

Decomposing Equity Market Returns

The Building Blocks Methodology



Q48. HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE EXPECTED EQUITY RISK PREMIUM?

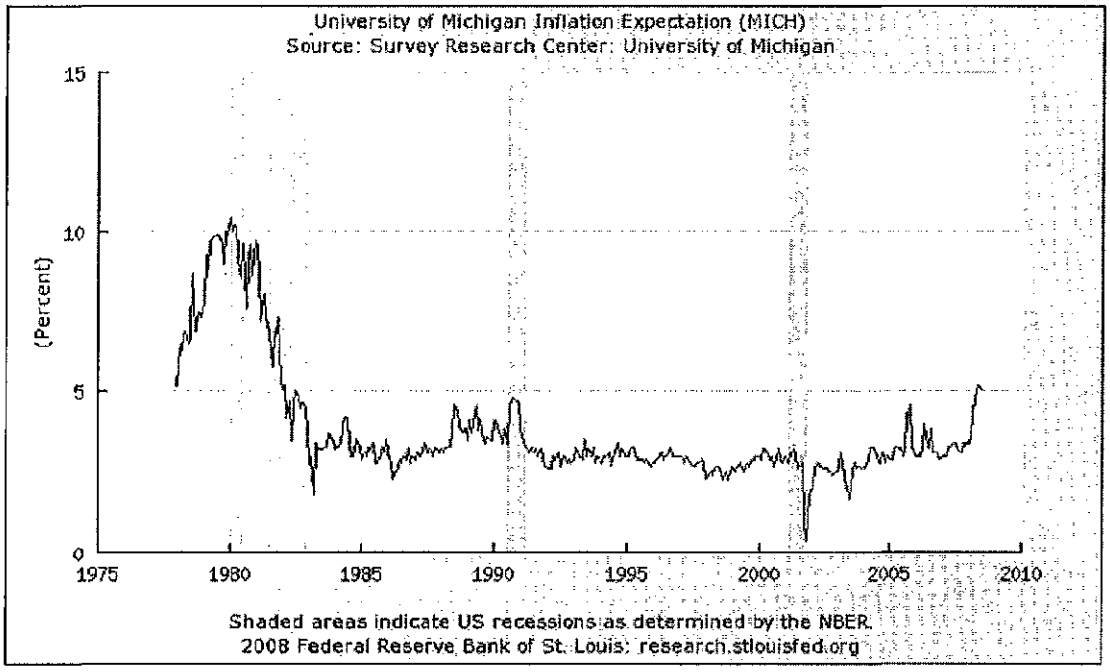
A48. The third column in the graph above shows current inputs to estimate an ex ante expected market return. These inputs include the following:

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. The graph below 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 5.1%.

Expected Inflation Rate

University of Michigan Consumer Research



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

Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters.*[19] This survey of professional economists has been published for almost 50 years. While this survey is published quarterly, only the first quarter

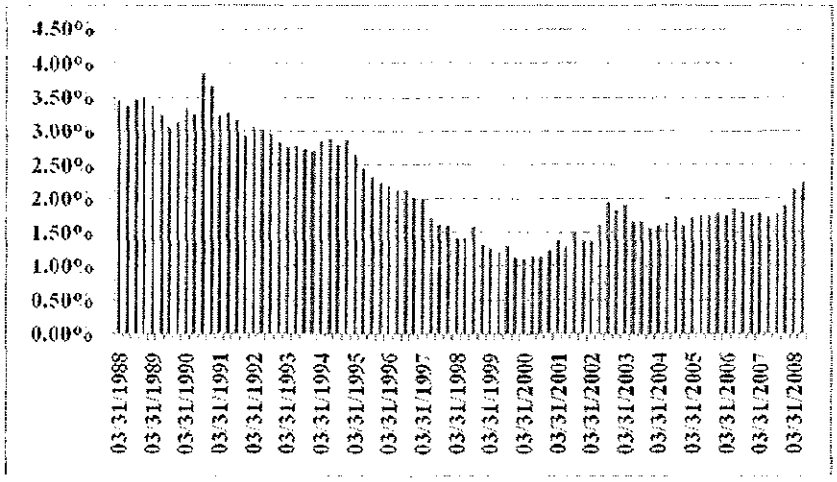
[19]Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters,* (February 12, 2008). The *Survey of Professional Forecasters* was formerly conducted by the American Statistical Association ("ASA") and the National Bureau of Economic Research ("NBER") and was known as the ASA/NBER survey. 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 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 4 of Exhibit JRW-7).

Given these results, I will use the average of the surveys of the University of Michigan and Federal Reserve Bank of Philadelphia (5.1% and 2.5%), or 3.8%.

D/P – As shown in the graph below, the dividend yield on the S&P 500 has decreased gradually over the past decade. Today, it is far 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 2.25% which I use in the ex ante risk premium analysis.

S&P 500 Dividend Yield



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 5 of Exhibit JRW-7, 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.[20] Real GDP growth,

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

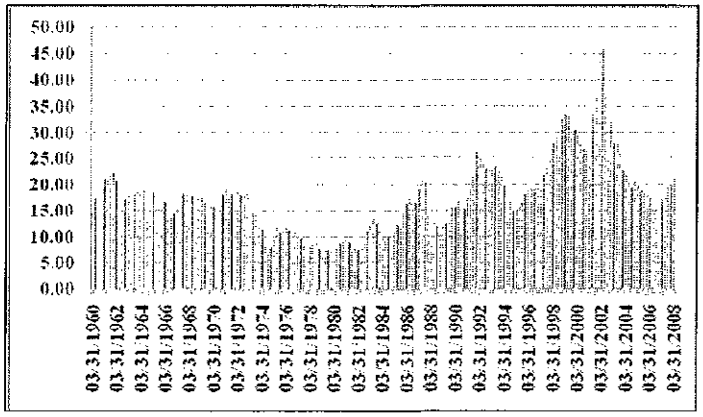
according to McKinsey, has averaged 3.5% over the past 80 years. Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.75% (see page 4 of Exhibit JRW-7).

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 graph below shows the P/E ratios for the S&P 500 over the past 25 years. The run-up and eventual peak in P/Es is most notable in the chart. The relatively low P/E ratios (in the range of 10) over two decades ago are also quite notable. As of July 31, 2008, the P/E for the S&P 500 was 20.99. [21]

[21] Source: www.standardandpoors.com.

S&P 500 PE Ratios



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 S&P 500 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.

Q49. GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED MARKET RETURN AND EQUITY RISK PREMIUM USING THE "BUILDING BLOCKS METHODOLOGY"?

A49. 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 47 of my testimony. As shown, my expected market return of 8.9% is composed of 3.8% expected inflation, 2.25% dividend yield, and 2.85% real earnings growth rate.

Q50. GIVEN THAT THE HISTORICAL COMPOUNDED ANNUAL MARKET RETURN IS IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET RETURN OF 8.9% IS REASONABLE?

A50. 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 2.25%. Due to these reasons, lower market returns are expected for the future.

Q51. IS YOUR EXPECTED MARKET RETURN OF 8.9% CONSISTENT WITH THE FORECASTS OF MARKET PROFESSIONALS?

A51. 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 4 of Exhibit JRW-7). This is consistent with my expected market return of 8.9%.

Q52. IS YOUR EXPECTED MARKET RETURN CONSISTENT WITH THE EXPECTED MARKET RETURNS OF CORPORATE CHIEF FINANCIAL OFFICERS (CFOs)?

A52. 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 June 2008 survey, the mean expected return on the S&P 500 over the next ten years was 8.14%.[22]

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

A53. As shown on page 39, the current 30-year U.S. Treasury yield is 4.37%. My ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

Ex Ante Equity Risk Premium = 8.9% - 4.37% = 4.53%

Q54. GIVEN THIS DISCUSSION, HOW ARE YOU MEASURING AN EXPECTED EQUITY RISK PREMIUM IN THIS PROCEEDING?

A54. As discussed above, page 3 of Exhibit JRW-7 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

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

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 premium is 4.57%, which I will use as the equity risk premium in my CAPM study.

Q55. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF LEADING INVESTMENT FIRMS?

A55. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall Street's leading investment strategists.[23] 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 today support the result of the academic studies. An article in *The Economist* indicated

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

that 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.[24]

Q56. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY CFOS?

A56. Yes. In the previously referenced June 2008 CFO survey conducted by *CFO Magazine* and Duke University, the expected 10-year equity risk premium was 4.14%.

Q57. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EX ANTE EQUITY RISK PREMIUMS OF PROFESSIONAL FORECASTERS?

A57. Yes. The financial forecasters in the previously referenced Federal Reserve Bank of Philadelphia survey project both stock and bond returns. As shown on page 4 of Exhibit JRW-7, 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%.

Q58. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING FIRMS?

[24] 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.

A58. Yes. 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.[25]

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

Q59. WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?

A59. The results of my CAPM study for the two proxy groups are provided below:

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

CAPM Equity Cost Rates

	Gas Proxy Group
Risk-Free Rate	**4.5%**
Beta	**0.82**
Equity Risk Premium	**4.57%**
Equity Cost Rate	**8.2%**

VII. EQUITY COST RATE SUMMARY

Q60. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A60. The results for my DCF and CAPM analyses for the proxy group of natural gas distribution companies are indicated below:

	DCF	CAPM
Gas Proxy Group	**9.6%**	**8.2%**

Q61. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR COLUMBIA?

A61. Given these results, I conclude that the appropriate equity cost rate for Columbia is in the 8.2%-9.6% range. Since I give greater weight to the DCF model, an equity cost rate of 9.25% is indicated.

Q62. IS THIS THE EQUITY COST RATE THAT YOU ARE RECOMMENDING FOR COLUMBIA IN THIS CASE?

A62. I am recommending 9.00% return on equity for Columbia. This represents a 25 basis point adjustment to reflect the risk-reducing rate-making mechanisms with respect to revenues and cost recovery proposed by the Company.

Q63. PLEASE DISCUSS THE RISK REDUCING RATEMAKING MECHANISMS BEING PROPOSED BY THE COMPANY IN THIS CASE?

A63. The Company has proposed the adoption of a straight-fixed variable ("SFV") rate design that serves to guarantee revenues for its distribution service by significantly increasing the fixed monthly charge and decreasing/eliminating the volumetric rate over the next two years. The Commission, in Case No. 07-589-GA-AIR[26], indicated that SFV is a type of revenue decoupling mechanism which achieves the same goals as a conventional revenue decoupling mechanism, which are revenues and earnings stability and certainty in cost recovery. The Company has also proposed an Infrastructure Replacement Program ("IRP") Rider that will provide for the recovery of costs associated with (1) an accelerated main replacement program, (2) the costs of a natural gas riser/service line replacement program, and (3) a new advanced metering program.

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26 Case No. 07-0589-GA-AIR et al, Opinion and Order, page 18 (May 28, 2008). reads: "The Commission, therefore, concludes that a rate design which separates or "decouples" a gas company's recovery of its cost of delivering the gas from the amount of gas customers actually consume is necessary to align the new market realities with important regulatory objectives… On balance, the Commission finds the levelized rate design advocated by Duke and Staff to be preferable to a decoupling rider. Both methods would address revenue and earnings stability issues in that the fixed costs of delivering gas to the home will be recovered regardless of consumption."

Q64. DO YOU BELIEVE THAT THE ADOPTION OF A SFV RATE DESIGN AND THE IRP SHOULD RESULT IN A REDUCTION IN AUTHORIZED RETURN ON COMMON EQUITY?

A64. Yes. These ratemaking mechanisms serve to significantly increase the stability of the Company's revenues and earnings, eliminate the need for frequent rate cases and rate case expenses, and insure certainty in cost recovery.

Q65. HAVE STATE PUBLIC UTILITY COMMISSIONS RECOGNIZED THE IMPACT OF DECOUPLING ON THE COST OF EQUITY?

A65. Yes. It has become common for regulatory commissions to recognize the risk reduction associated with the adoption of decoupling ratemaking mechanisms and make an adjustment to the authorized return on equity.

Q66. CAN YOU GIVE EXAMPLES OF STATE COMMISSION DECISIONS THAT MAKE THIS ADJUSTMENT TO ALLOWED ROE LEVELS?

A66. Yes. In a December 22, 2006 Decision in Docket Nos. 7175 and 7176, the Vermont Public Service Board reduced the Green Mountain Power Corporation's allowed ROE by 50 basis points for the adoption of an alternative regulation plan that included a decoupling mechanism.

In a July 19, 2007 Decision in Order No. 81517 Case No. 9092, the Maryland Public Service Commission adjusted Potomac Electric Power Company's authorized ROE downward by 50 basis points to reflect reduced risk associated

with a decoupling mechanism. On the same date, the Maryland Public Service Commission in Order No. 81518 Case No. 9093 also reduced the authorized ROE by 50 basis points for the Delmarva Power & Light Company due to the adoption of a decoupling mechanism.

Q67. ARE THESE DECISIONS CONSISTENT WITH OTHER DECISIONS OF REGULATORY COMMISSIONS?

A67. Yes. Appendix B provides a summary of the regulatory commission decisions that I am aware of in which a decoupling mechanism was adopted. In general, regulatory commissions have made ROE adjustments in the 25 to 50 basis points range upon adoption of a decoupling rate design.

Q68. WHAT IS YOUR RECOMMENDATION REGARDING RETURN ON EQUITY IF THE COMPANY'S SFV RATE DESIGN PROPOSAL AND IRP RIDER ARE APPROVED BY THE COMMISSION?

A68. If the proposed SFV and IRP proposals are adopted as a permanent decoupling mechanism or rate design by the Commission, I recommend that the Company's equity cost rate be reduced by 25 basis points to recognize the reduction in business risk of the Company. Given the cases cited in Appendix B for the decoupling decisions, this 25 basis point reduction to COH's equity cost rate represents a very conservative adjustment to address the Company's reduction in business risk.

Q69. PLEASE DISCUSS YOUR RATE OF RETURN IN LIGHT OF RECENT YIELDS ON 'A' RATED PUBLIC UTILITY BONDS.

A69. In recent months the yields on long-term public utility bonds have been in the 6.0% range. My rate of return may appear to be too low given these yields. However, as previously noted, my recommendation must be viewed in the context of the significant decline in the market or equity risk premium. As a result, the return premium that equity investors require over bond yields is much lower today. This decline was previously reviewed in my discussion of capital costs in today's markets.

Q70. HOW DO YOU TEST THE REASONABLENESS OF YOUR COST OF EQUITY AND OVERALL RATE OF RETURN RECOMMENDATION?

A70. 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 proxy groups of gas distribution companies.

Q71. WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-BOOK RATIOS FOR THE PROXY GROUP OF GAS DISTRIBUTION COMPANIES INDICATE ABOUT THE REASONABLENESS OF YOUR RECOMMENDATION?

A71. Exhibit JRW-2 provides financial performance and market valuation statistics for the proxy group of gas distribution companies. The mean current return on equity and market-to-book ratios for the group are summarized below:

	Current ROE	Market-to-Book Ratio
Gas Proxy Group	**11.2 %**	**1.82**

Source: Exhibit JRW-2

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 gas distribution companies.

Q72. WHAT DO THE IMPLIED PRE-TAX INTEREST COVERAGE RATIOS INDICATE ABOUT THE ADEQUACY OF YOUR OVERALL RATE OF RETURN RECOMMENDATIONS FOR COLUMBIA?

A72. As shown on Exhibit JRW-1, the implied pre-tax interest coverage ratio for Columbia based on my recommendation is 3.3X. Exhibit JRW-2 provides financial performance and market valuation statistics for proxy group of gas distribution companies as listed by *Value Line*. The range of the pre-tax interest

coverage ratios for the Gas Proxy Group is 2.4X and 6.0X. These results indicate that my overall recommended rate of return produces an implied interest coverage ratio within the range of the Gas Proxy Group.

	Columbia Implied with 9.25% ROE	**Gas Proxy Group Range**
Pre-Tax Interest Coverage	3.3X	2.4X-6.0X

Q73. FINALLY, PLEASE DISCUSS THE IMPACT OF RECENT CAPITAL MARKET VOLATILITY CONDITIONS ON THE EQUITY RISK PREMIUM AND THE EQUITY COST RATE.

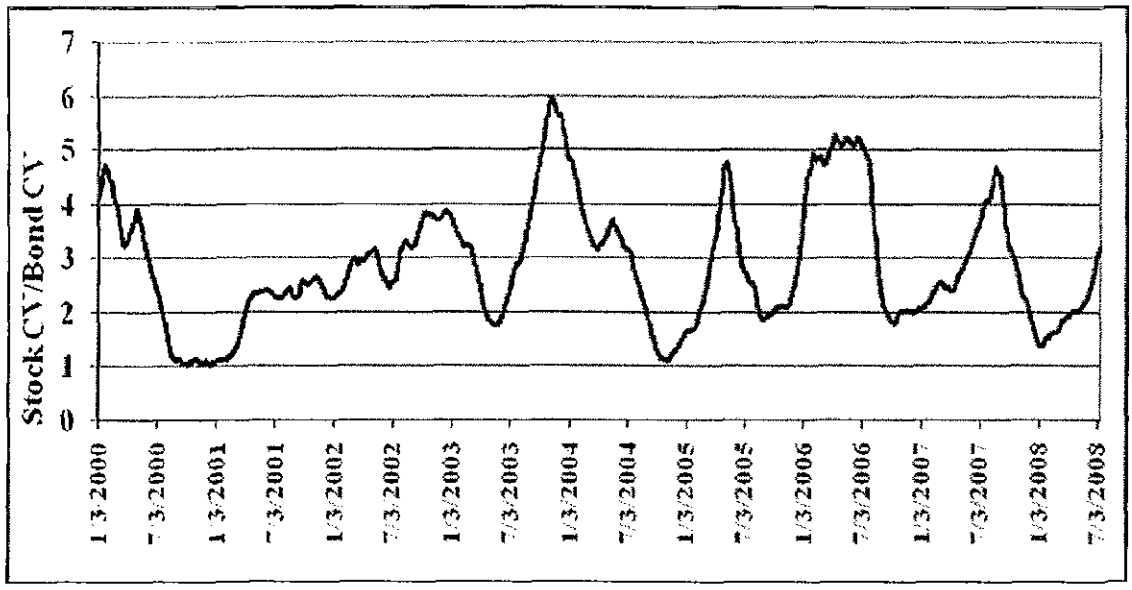
A73. To assess the impact of recent capital market volatility on the equity risk premium and the equity cost rate, one must look at the volatility of stocks relative to bonds. I have performed such an analysis below. To compare the volatility of stock and bonds, one must standardize the volatility measure. 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").

Q74. GIVEN THESE OBSERVATIONS, PLEASE PROVIDE YOUR ASSESSMENT OF THE IMPACT OF RECENT CAPITAL MARKET CONDITIONS ON THE EQUITY COST RATE.

A74. I have performed an analysis of the volatility of stocks relative to bonds since 2000. I have used the S&P 500 and the Bear Sterns Bond Price Index ("BSBPI")

and computed the CV using a 200-day mean and standard deviation. In Figure 1 below, 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. During the last two quarters of 2007, the volatility of bonds increased relative to stocks due to the subprime mortgage crisis. Over the first two quarters of 2008, stocks have increased in volatility relative to bonds. Nonetheless, the relative volatility of stocks to bonds is near the midpoint of the range of the 2000-2008 time period. Over the 2000-2008 period, the average ratio of stocks/bond volatility was 2.9. As of July, 2008, this figure was 3.2. As such, current market conditions do not suggest that stocks are significantly more volatile than bonds. Hence, the premium that equity investors require relative to bonds should not have changed significantly.

Coefficient of Variation
S&P 500 Price CV/Bear Sterns Bond Price Index CV
2001-2008



VIII. CRITIQUE OF COLUMBIA'S RATE OF RETURN TESTIMONY

Q75. PLEASE EVALUATE THE COMPANY'S RATE OF RETURN POSITION.

A75. The Company's proposed rate of return is inflated due to overstated long-term debt and equity cost rates. The long-term debt cost rate was previously discussed. I will now discuss the errors with Mr. Moul's equity cost rate analysis.

Q76. PLEASE REVIEW MR. MOUL'S EQUITY COST RATE APPROACHES.

A76. Mr. Moul uses a proxy group of electric and gas companies and employs a DCF, RP, CAPM, and CE approaches.

***Q77. PLEASE SUMMARIZE MR. MOUL'S EQUITY COST RATE* RESULTS.**

A77. Mr. Moul's equity cost rate estimates for Columbia are summarized in the table below. Based on these figures, he concludes that the appropriate equity cost rate for the Company is 11.50%.

Summary of Mr. Moul's Equity Cost Rate Approaches and Results

Approach	Moul Proxy Group
DCF	11.27%
RP	11.47%
CAPM	14.07%
CE	13.90%

Q78. PLEASE DISCUSS YOUR ISSUES WITH MR. MOUL'S RECOMMENDED EQUITY COST RATE.

A78. Mr. Moul's proposed return on common equity is too high primarily due to: (a) his use of a proxy group of electric and gas companies for Columbia, (b) an excessive adjustment to the dividend yield and an inflated growth rate in his DCF approach, (c) an incorrect leverage adjustment to account for the difference between market values and book values, (d) overstated equity risk premium estimates in his RP and CAPM approaches, (e) an adjustment to account for the size of the Company, and (f) a flawed CE approach.

A. Moul Proxy Group

Q79. PLEASE DISCUSS THE PROBLEM WITH MR. MOUL'S PROXY GROUP.

A79. In this proceeding Mr. Moul has elected to use a group of combination electric and gas companies as a proxy group for Columbia. In my opinion, Mr. Moul has employed the results for this group since he believes that the equity cost rate results for gas companies as indicated by the DCF model are too low. Such reasoning is flawed and does not make the Moul Proxy Group an adequate proxy for a gas company.

Exhibit JRW-8 shows the financial statistics for the Moul Proxy Group. The Moul Proxy Group is much larger than the Gas Proxy Group, with average operating revenues, net plant, and market capitalization of are $4,545.9M, $4,967.3M, and $3.3B, respectively. The group has a slightly lower bond credit rating, and has a lower common equity ratio (51%) and earned return on common equity (10.3%). However, most importantly, the group, on average, receives 66% of its revenues from regulated electric utility service. In short these are primarily electric utility companies and not gas distribution companies and should not be employed as a proxy for the Company.

B. DCF Approach

Q80. PLEASE SUMMARIZE MR. MOUL'S DCF ESTIMATES.

A80. On pages 24-40 of his testimony, in Appendix E, and in Attachments PRM-8 – PRM-10, Mr. Moul develops an equity cost rate by applying a DCF model to the

Moul Proxy Group. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Mr. Moul adjusts this figure for a leverage adjustment to reflect the difference between the market value and book value capital structures of the companies in the Moul Proxy Group. Mr. Moul's DCF results are summarized below.

DCF Equity Cost Rate

	Moul Proxy Group
Adjusted Dividend Yield	**4.01%**
Growth	**6.25%**
DCF Result	**10.26%**
Leverage Adjustment	**0.79%**
Leverage-Adjusted DCF Equity Cost Rate	**11.05%**
Flotation Cost Adjustment	**1.02**
Adjusted DCF Result	**11.27%**

Q81. PLEASE EXPRESS YOUR CONCERNS WITH MR. MOUL'S DCF STUDY.

A81. I have five issues with Mr. Moul's DCF equity cost rate. These are the Moul Proxy Group, the dividend yield adjustment, the DCF growth rate, and the leverage and flotation cost adjustments. The errors in the Moul Proxy Group are discussed above. The other issues are reviewed below.

DCF Dividend Yield Adjustment

Q82. PLEASE DISCUSS THE ADJUSTMENT TO THE DIVIDEND YIELD TO REFLECT THE QUARTERLY PAYMENT OF DIVIDENDS.

A82. In Appendix E of his direct testimony, Mr. Moul discusses the adjustments he makes to his dividend yields. This includes an adjustment to reflect the time value of money. The quarterly timing adjustment is in error and results in an overstated equity cost rate. First, as indicated on page 30 above, 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, Mr. Moul'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. Mr. Moul'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

Mr. Moul. However, he demonstrates that this does not result in a biased required rate of return. He provides the following assessment: [27]

> ... 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.

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

Q83. PLEASE CRITIQUE MR. MOUL'S DCF GROWTH RATE OF 6.25%.

A83. In his Schedules 9 and 10, Mr. Moul provides sixteen alternative measures of growth he claims to have reviewed in arriving at his 6.25% growth rate. The average of these figures is well below 6.25%, and only three of the sixteen growth rates are as large as 6.25%. As such, Mr. Moul's DCF growth rate is grossly overstated, and he has ignored the vast majority of his historic and projected growth rate measures.

Q84. GIVEN THAT MR. MOUL'S HISTORICAL AND PROJECTED GROWTH RATE MEASURES DO NOT SUPPORT HIS 6.25% DCF GROWTH RATE FOR THE MOUL GAS GROUP, HOW DO YOU BELIEVE HE ARRIVES AT THE 6.25% FIGURE?

A84. Mr. Moul appears to have relied exclusively on selected EPS growth rate forecasts of Wall Street analysts and on selected *Value Line* growth rate measures. It also appears that Mr. Moul has ignored the vast majority of his DCF growth rate measures.

Q85. PLEASE DISCUSS MR. MOUL'S EXCLUSIVE RELIANCE ON SELECTED ANALYSTS' AND VALUE LINE GROWTH RATE MEASURES.

A85. It seems highly unlikely that investors today would rely exclusively 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

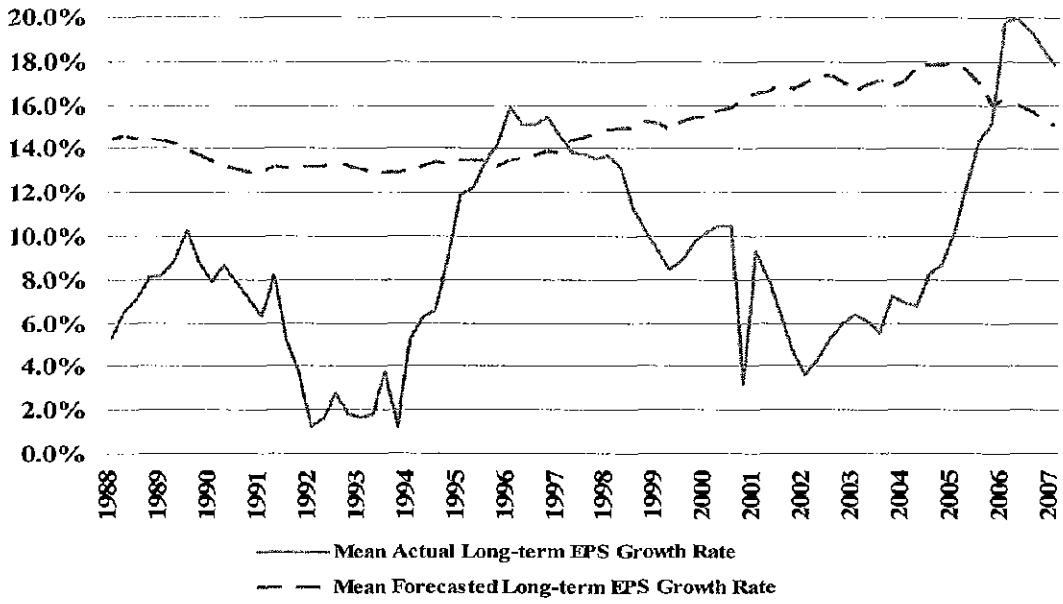
securities analysts are overly optimistic and biased upwards. In addition, as I show below, *Value Line*'s EPS forecasts are excessive and unrealistic.

Q86. PLEASE REVIEW THE BIAS IN ANALYSTS' GROWTH RATE FORECASTS.

A86. Analysts' growth rate forecasts are collected and published by 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 the graph below, I show the average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5 year EPS growth rate. Because of the necessary 3-5 year follow-up period to measure actual growth, the analysis in this graph only: (1) covers forecasted and actual EPS growth rates through 1999 and (2) includes only companies that have 3-5 years of actual EPS data following the forecast period.

Long-Term Forecasted Versus Actual EPS Growth Rates
1988-2006



Source: Patrick J. Cusatis and J. Randall Woolridge, "The Accuracy of Analysts' Long-Term Earnings Per Share Growth Rate Forecasts," (January 24, 2008).

The following example shows how the results can be interpreted. For the 3-5-year 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

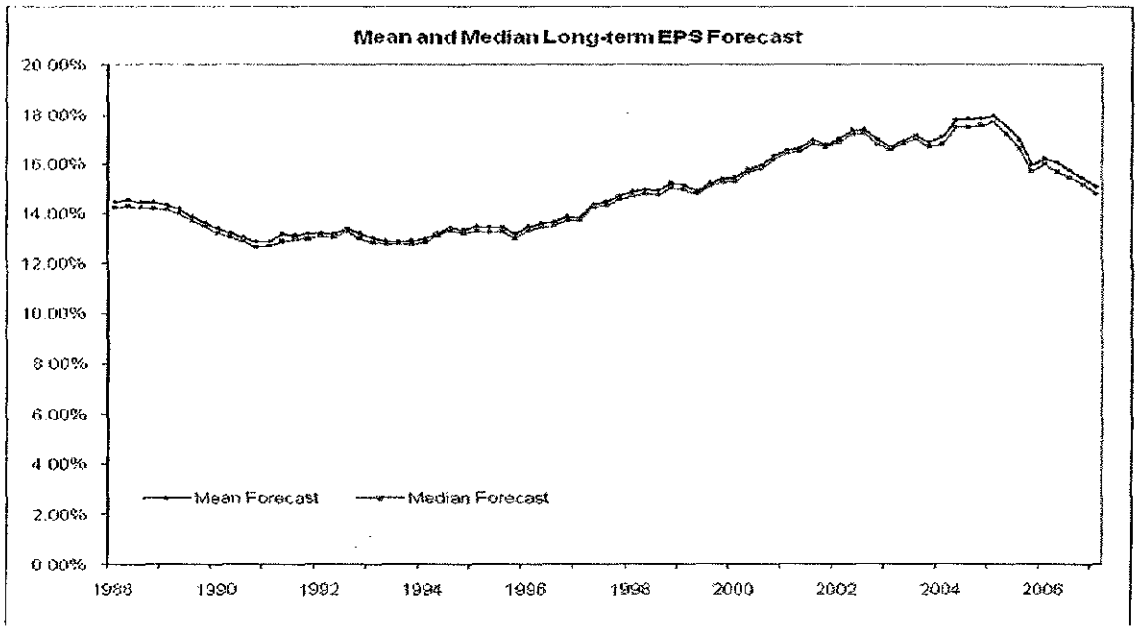
twenty year period are 143.06% and 75.08%, respectively. The forecast errors are negative for only eleven of the eighty quarterly time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As shown in the figure below, the quarters with negative forecast errors were for the 3-5 year periods following earnings declines associated with the 1991 and 2001 economic recessions in the U.S. Overall, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

The post-1999 period has seen the boom and then the bust in the stock market, an economic recession, 9/11, and the Iraq war. Furthermore, and highly significant in the context of this study, we have also had the New York State investigation of Wall Street firms and the subsequent Global Securities Settlement in which nine major brokerage firms paid a fine of $1.5B for their biased investment research.

To evaluate the impact of these events on analysts' forecasts, the graph below provides 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 2006. In this graph no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, 3-5 year growth rate forecasts are shown until 2006, and 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 growth has since declined to the 15.0% range.

Long-Term IBES 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," (January 24, 2008).

While analysts' EPS growth rate forecasts have subsided since 2000, these results suggest that, despite the New York State investigation and the Global Analysts Research Settlement, analysts' EPS forecasts are still upwardly biased. The actual 3-5 year EPS growth rate over time has been about one half the projected 3-5 year growth rate forecast of 15.0%. Furthermore, as discussed later in my testimony, historic growth in GNP and corporate earnings has been in the 7% range. This observation is 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.[28]

Q87. IS THE BIAS IN ANALYSTS' GROWTH RATE FORECAST GENERALLY KNOWN IN THE MARKETS?

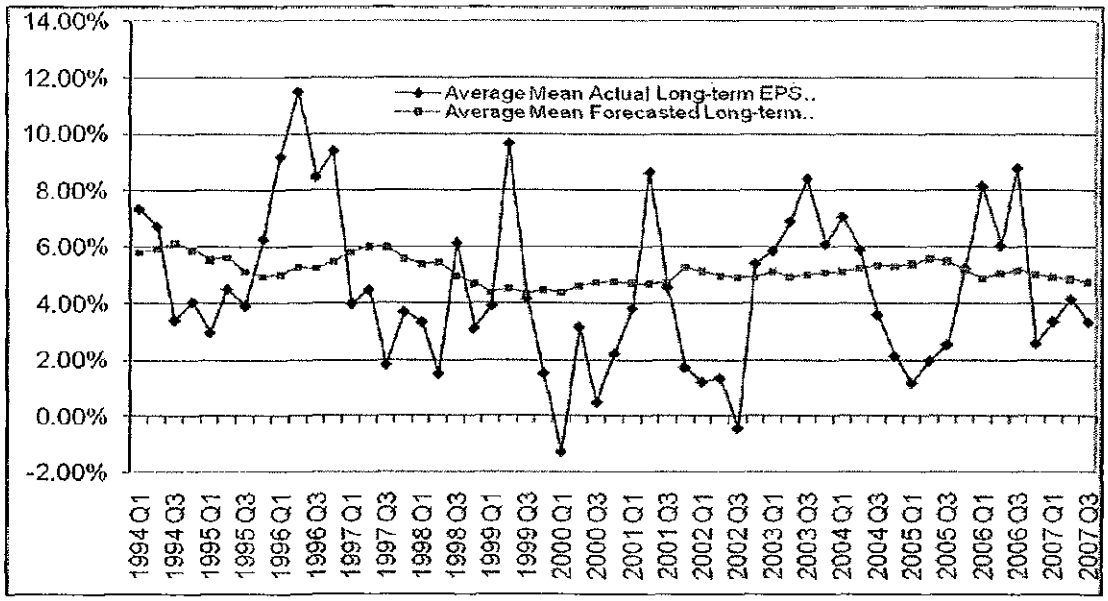
A87. Yes. Exhibit JRW-9 provides a recent article published in the *Wall Street Journal* that discusses the upward bias in analysts' EPS growth rate forecasts.

[28] 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.

Q88. ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE UPWARDLY BIASED FOR NATURAL GAS DISTRIBUTION COMPANIES?

A88. Yes. To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for natural gas distribution companies, I conducted a study similar to the one described above using a group of gas companies. The results are shown in the chart below. 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 gas distribution companies it is for all companies. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 5.15% and 4.53%, respectively. The results here are consistent with the results for companies in general -- analysts' projected EPS growth rate forecasts are upwardly-biased for utility companies.

Analysts' Forecasted 3-5-Year Forecasted Versus Actual EPS Growth Rates
Natural Gas Distribution Companies
1990-2007



Q89. ARE VALUE LINE'S GROWTH RATE FORECASTS SIMILARILY UPWARDLY BIASED?

A89. 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 the table below. 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.

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 Firms	**14.6%**	**47**	**1.9%**

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 shown in the table below 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.

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	**12.9%**	**476**	**20.1%**

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 forecasts negative earnings growth.

Q90. PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. MOUL'S DCF GROWTH RATE.

A90. Mr. Moul's DCF growth rate is overstated because he has relied solely on the upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line.* Furthermore, this figure is not supported by his own historic and projected growth rates, which are presented in his Schedules 9 and 10.

C. Leverage Adjustment

Q91. PLEASE REVIEW MR. MOUL'S LEVERAGE ADJUSTMENT.

A91. Mr. Moul's DCF results include a leverage adjustment, which is described in Appendix E of his testimony. Mr. Moul claims that this is needed since (1) market values are greater than book values for utilities and (2) the overall rate of return is applied to a book value capitalization in the ratemaking process. This adjustment is erroneous and unwarranted for the following reasons:

1. The market value of a firm's equity exceeds the book value of equity when the firm is expected to earn more on the book value of investment than investors require. This relationship is described very succinctly in the Harvard Business School case study which I quote on page 18 of my testimony. As such, the reason that market values exceed book values is that the company is earning a return on equity in excess of its cost of equity;
2. Despite Mr. Moul's contention that this represents a leverage adjustment, there is no change in leverage. There is no need for a leverage adjustment since there is no change in leverage. The Company's financial statements

and fixed financial obligations remain the same;

3. Financial publications and investment firms report capitalizations on a book value and not a market value basis;

4. Mr. Moul makes the claim that the market value – book value adjustment was based on the research of Nobel prize winners Modigliani and Miller. Mr. Moul was asked in OCC-II-80 to identify exactly where one could find his proposed adjustment in the research of Modigliani and Miller. He was unable to do so; and

5. Mr. Moul has presented his leverage adjustment in many rate cases before many regulatory commissions. In OCC-II-79, Mr. Moul was asked to list all rate cases in which a regulatory commission adopted his leverage adjustment. In response, Mr. Moul lists six cases in which the Pennsylvania Public Utility Commission ("PPUC") has made the leverage adjustment.

Q92. HAS THE PPUC SINCE REVERSED ITS POSITION ON THE APPROPRIATENESS OF MR. MOUL'S LEVERAGE ADJUSTMENT?

A92. Yes. In the recent Aqua Pennsylvania case, the PPUC reversed its previous position and rejected Mr. Moul's leverage adjustment.

Q93. PLEASE EXPLAIN WHY YOU BELIEVE THAT REGULATORY COMMISSIONS HAVE REJECTED MR. MOUL'S LEVERAGE ADJUSTMENT?

A93. I believe that Mr. Moul's leverage adjustment has been rejected by regulatory commissions because it is erroneous and produces illogical results. The leverage adjustment is illogical because it increases the ROEs for utilities that have high returns on common equity and decreases the ROEs for utilities that have low returns on common equity.

In the graphs presented on pages 19-20, I have demonstrated that there is a strong positive relationship between expected returns on common equity and market-to-book ratios for public utilities. Hence, in the context of Mr. Moul's leverage adjustment, this means that: (1) for a utility with a relatively high market-to-book ratio (e.g., 2.5) and ROE (e.g., 12.0%), the leverage adjustment will increase the estimated equity cost rate, while (2) for a utility with a relatively low market-to-book ratio (e.g., 0.5) and ROE (e.g., 5.0%), the leverage adjustment will decrease the estimated equity cost rate. Such an adjustment defies logic because you are increasing the estimated equity cost rate for the high market-to-book utility and decreasing the estimated equity cost rate for the low market-to-book utility. Therefore, the adjustment will result in even higher market-to-book ratios for utilities with relatively high ROEs and even lower market-to-book ratios for utilities with relatively low ROEs.

D. Flotation Costs

Q94. PLEASE DISCUSS MR. MOUL'S ADJUSTEMT FOR FLOTATION COSTS.

A94. Mr. Moul adjusts his equity cost rates using the DCF and other approaches for flotation costs. This adjustment factor is erroneous for several reasons. First, the Company has not identified any actual flotation costs for itself. Therefore, the Company is requesting annual revenues in the form of a higher return on equity for flotation costs that have not been identified. Second, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the existing shareholders. In this case, a floatation cost adjustment is 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 gas companies are nearly 2.0 actually 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 gas 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. If a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment, then 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, gas 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 the Company believes that it should be compensated for these transactions costs, they have not 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 the Company had included these brokerage fees or transaction costs in their DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. This would result in a downward adjustment to their DCF equity cost rate.

E. CAPM Analysis

Q95. PLEASE DISCUSS MR. MOUL'S CAPM.

A95. On pages 46 to 51, Attachment PRM-13, and Appendix I, Mr. Moul applies the CAPM method to the Moul Proxy Group. This result is summarized below:

CAPM Equity Cost Rate
Moul Gas Group

	CAPM
Risk-Free Rate	**4.50%**
Beta	**1.01**
Market Risk Premium	**8.30%**
CAPM Result	**12.88 %**
Size Adjustment	**0.97%**
Size-Adjusted CAPM Result	**13.85%**
Flotation Cost Adjustment	**0.22**
CAPM Equity Cost Rate	**14.07%**

Q96. WHAT ARE THE ERRORS IN MR. MOUL'S CAPM ANALYSIS.

A96. There are four flaws with Mr. Moul's CAPM analysis: (1) the use of leverage-adjusted betas; (2) the equity risk premium of 8.30%; (3) the size adjustment of 0.97%; and (4) the flotation cost adjustment. The flotation cost adjustment was discussed above. The other errors are reviewed below.

Q97. PLEASE DISCUSS MR. MOUL'S USE OF LEVERAGE-ADJUSTED BETAS IN HIS CAPM APPROACH.

A97. Whereas the average beta for the proxy group is 0.85, Mr. Moul employs a beta of 1.01. He has adjusted the beta upwards for the book value/market value capitalization difference. As such, he has effectively made the same leverage adjustment to his betas that he made to his DCF results to reflect the difference between the market values and the book values of the companies in his proxy group. The errors in this approach are the same as those discussed above.

Q98. PLEASE REVIEW THE ERRORS IN MR. MOUL'S EQUITY OR MARKET RISK PREMIUM IN HIS CAPM APPROACH.

A98. The primary problem with Mr. Moul's CAPM analysis is the size of the market or equity risk premium. Mr. Moul develops a market risk premium of 8.30% in his Appendix I. It is computed as the average risk premium of: (1) the 1926-2007 historic risk premium results from the Ibbotson study of 6.50% and (2) a projected market risk premium of 10.10% using an expected market return, which is the average of: (a) *Value Line's* 3-5 year annual return projection and (b) a DCF expected market return using the S&P 500. The primary error with Mr. Moul's equity risk premium is that both the Ibbotson historic returns and Mr. Moul's projected market returns are overstated as measures of expected market risk premiums.

Q99. PLEASE ADDRESS THE ISSUES INVOLVED IN USING HISTORICAL STOCK AND BOND RETURNS TO COMPUTE A FORWARD-LOOKING OR EX ANTE RISK PREMIUM.

A99. Using the historical relationship between stock and bond returns to measure an ex ante equity risk premium is erroneous and especially in this case, 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. At the present time, 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.

Q100. PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.

A100. There are a number of flaws in using historic returns over long time periods to estimate expected equity risk premiums. These issues include:

1. Biased historical bond returns;
2. The arithmetic versus the geometric mean return;
3. The large error in measuring the equity risk premium using historical returns;
4. Unattainable and biased historical stock returns;
5. Company Survivorship bias;
6. The "Peso Problem" - U.S. stock market survivorship bias;
7. Market conditions today are significantly different than the past; and
8. Changes in risk and return in the markets.

These issues will be addressed in order.

1. <u>Biased Historical Bond Returns</u>

Q101. HOW ARE HISTORICAL BOND RETURNS BIASED?

A101. 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.

2. The Arithmetic versus the Geometric Mean Return

Q102. PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON METHODOLOGY.

A102. 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."[29] Since Mr. Moul'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.

[29] 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.

Q103. PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH USING THE ARITHMETIC MEAN RETURN.

A103. 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 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.[30] Therefore,

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

Mr. Moul's arithmetic mean return measures are upwardly biased and should be disregarded.

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

Q104. PLEASE DISCUSS THE LARGE ERROR IN MEASURING THE EQUITY RISK PREMIUM USING HISTORICAL STOCK AND BOND RETURNS.

A104. Measuring the equity risk premium using historical stock and bond return 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.

4. Unattainable and Biased Historic Stock Returns

Q105. YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE IBBOTSON METHODOLOGY. PLEASE ELABORATE.

A105. 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.[31]

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.

5. Company Survivorship Bias

Q106. HOW DOES COMPANY SURVIVORSHIP BIAS AFFECT MR. MOUL'S HISTORIC EQUITY RISK PREMIUM?

A106. 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

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

from these indexes is not reflected. Therefore, these stock returns are upwardly biased because they only reflect the returns from more successful companies.

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

Q107. WHAT IS THE "PESO PROBLEM," AND HOW DOES IT RELATE TO SURVIVORSHIP BIAS IN U. S. STOCK MARKET RETURNS?

A107. Mr. Moul'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" issue was first highlighted by the Nobel laureate, Milton Friedman, and gets 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.

7. Market Conditions Today are Significantly Different than in the Past

Q108. FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS HOW MARKET CONDITIONS ARE DIFFERENT TODAY.

A108. 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.

8. Changes in Risk and Return in the Markets

Q109. PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK PREMIUM STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN TODAY'S FINANCIAL MARKETS.

A109. 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-10 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 increase 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-10. 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 -38% in 1931. Evidence of a change in the relative riskiness of bonds and stocks is provided on page 3 of Exhibit JRW-10, 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 (see former Federal Reserve Chairman Greenspan's comments on pages 8-9 in this testimony) 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-10, 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.

Q110. DO YOU HAVE ANY OTHER THOUGHTS ON THE USE OF HISTORICAL RETURN DATA TO ESTIMATE AN EQUITY RISK PREMIUM?

A110. 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.[32] 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.

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

Q111. PLEASE CRITIQUE MR. MOUL'S PROSPECTIVE EQUITY OR MARKET RISK PREMIUM OF 8.30%, WHICH HE CALCULATES EXPECTED MARKET RETURNS USING VALUE LINE'S PROJECTED RETURNS AND APPLYING A DCF MODEL TO THE S&P 500.

A111. Mr. Moul computes an expected equity risk premium of 8.30% using an expected market return of 14.60%, which is the average of: (a) *Value Line's* 3-5 year annual return projection of 15.44% and (b) a DCF expected market return using the S&P 500 of 13.76%. The primary error in using *Value Line's* 3-5 year annual return projections is that these projections are consistently high relative to actual experienced returns and as such, provide upwardly biased equity risk premiums. In addition, Mr. Moul's application of a DCF model to the S&P 500 is significantly overstated and unrealistic because he employs an expected DCF growth rate based on analysts' forecasted EPS growth rates.

Q112. PLEASE ASSESS MR. MOUL'S EXPECTED MARKET RETURN OF 15.44% BASED ON VALUE LINE'S PROJECTED RETURNS.

A112. Mr. Moul's expected equity risk premium is based in part on an expected stock market return of 15.44% as computed using *Value Line's* 3-5 year projected market price appreciation potential. The problem with this approach is that *Value Line* has consistently overstated market price appreciation potential in the past. This bias is highlighted in a study shown in Exhibit JRW-11. Over the 1984-2004 time period, this study demonstrates that *Value Line's* projected 3-5 year annual return has been,

on average, 3.64% above the actual 3-5 year annual return. As such, *Value Line's* 3-5 year annual returns produce excessive equity risk premiums.

This positive bias in *Value Line*'s 3-5 year annual returns shown above is corroborated in a study performed by *Value Line* itself. Page 2 of Exhibit JRW-11 shows *Value Line*'s own study, which demonstrates that its projected market appreciation potential has been in excess of the price appreciation.

Q113. PLEASE PROVIDE ADDITIONAL EMPIRICAL EVIDENCE ON BIASES IN USING VALUE LINE'S DIVIDEND YIELD AND MEDIAN APPRECIATION POTENTIAL TO ESTIMATE AN EXPECTED MARKET RETURN.

A113. To evaluate the use of *Value Line*'s data to estimate an expected market return, I used the *Value Line Investment Analyzer* (May 1, 2008). I discovered three errors in Mr. Moul's analysis, which lead to an overstatement of the expected market return and therefore, equity risk premium using *Value Line's* dividend yield and 3-5 year median appreciation potential. These errors include:

1. The dividend yield of 2.1% used by Mr. Moul is only for stocks followed by *Value Line* that pay a dividend. As of May 1, 2008, *Value Line* reported no dividend yield for 752 of its 1,704 stocks (44% of the 1,704 stocks). Therefore, the expected return on these stocks using the DCF model would simply be the annual price appreciation potential. The median dividend yield for all 1,704 stocks is 0.57%. By using the

dividend yield for only those stocks that pay a dividend, Mr. Moul has inflated his dividend yield by 1.53% (2.1% - 0.57% = 1.53%).

2. As shown above, *Value Line* has a tendency to produce inflated projected measures of growth, primarily since the service rarely forecasts negative growth. As of May 1, 2008, *Value Line* projected negative price appreciation potential for only 61 of the 1,688 stocks. This is only 3.6% of the stocks it covers. In other words, *Value Line*'s presumption is that 96.4% of stocks will see price appreciation over the next 3-5 years. This is an unrealistic assumption. To put this figure in perspective, *Value Line* reported a negative stock return over the last five years for 18% of its stocks.

3. Using the median appreciation potential results in an inflated expected market return and equity risk premium, since it effectively gives equal weight to all 1,704 stocks. That is, all companies are weighted equally in producing the median price appreciation potential. Therefore, by using the median price appreciation potential, *Value Line* gives the same weight to Exxon Mobil, with a market capitalization of $483B, as it does to Cost Plus Inc, with a market capitalization of a $62.9M. Obviously, Exxon Mobil is a much, much bigger part of the stock market than Cost Plus, and therefore, should be given a much greater weight in determining an expected market return.

Q114. PLEASE ASSESS MR. MOUL'S EQUITY RISK PREMIUM DERIVED FROM APPLYING THE DCF MODEL TO THE S&P 500.

A114. Mr. Moul also estimated an expected market return of 13.76% by applying the DCF model to the S&P 500. This approach uses a dividend yield of 2.2% and an expected DCF growth rate of 11.42%. The primary error in this approach is that his expected DCF growth rate is the projected 5-year EPS growth rate for the companies in the S&P 500 as reported by First Call. As explained below, this produces an overstated expected market return and equity risk premium.

Q115. WHAT EVIDENCE CAN YOU PROVIDE THAT THE MR MOUL'S S&P 500 GROWTH RATE IS EXCESSIVE?

A115. Mr. Moul's expected S&P 500 growth rate of 11.42% represents the forecasted 5-year EPS growth rates of Wall Street analysts. The error with this approach is that the EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased.

Q116. CAN YOU PROVIDE ADDITIONAL EVIDENCE REGARDING THE PROBLEMS OF MR. MOUL'S DCF GROWTH RATE FOR THE S&P 500 OF 11.42%?

A116. Yes. A long-term growth rate of 11.42% 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-12, 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, Mr. Moul's long-run growth rate projection of 11.42% 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.

Q117. PLEASE PROVIDE A SUMMARY ASSESSMENT OF MR. MOUL'S EQUITY RISK PREMIUMS DERIVED FROM EXPECTED MARKET RETURNS.

A117. Mr. Moul's equity risk premiums derived from expected market return models are inflated due to errors and bias in his studies. 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 8.14% over the next ten years.

Q118. FINALLY, PLEASE ADDRESS MR. MOUL'S CAPM ADJUSTMENT FOR THE SIZE OF THE COMPANY.

A118. Mr. Moul adjusts his equity cost rate results (adding 0.97%) to account for the size of the Company. He supports his size premium on the basis of a historical return analysis performed by Ibbotson Associates. There are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are the well-known survivorship bias (only successful companies survive – poor companies do not survive) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). These biases are discussed at more length earlier in my testimony. The net result is that Ibbotson's size premiums are poor measures for any risk adjustment to account for the size of the Company. This observation is further supported by a review of the Ibbotson study. The Ibbotson study used for the explicit size premium is based on the stock returns for companies in the 10^{th} size decile. A review of Ibbotson documents indicates that these companies have betas that are larger than the betas of gas distribution companies. Hence, these size premiums are not associated with the gas distribution industry.

Finally, and most significantly, Professor Annie Wong has tested for a size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant size premium.[33] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments. In addition, public utilities must gain approval from government entities for common financial transactions such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other interested parties. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a size premium.

F. Risk Premium Study

Q119. PLEASE REVIEW MR. MOUL'S RISK PREMIUM ANALYSIS.

A119. On pages 41-46 of his testimony, Attachments PRM-11 and PRM-12, and Appendices G and H, Mr. Moul arrives at a risk premium ("RP") derived equity cost

[33] Annie Wong, "Utility Stocks and the Size Effect: An Empirical Analysis," *Journal of the Midwest Finance Association*, (1993), pp. 95-101.

rate of 11.47% for the Moul Proxy Group. These figures include a base yield of 6.00% and an equity risk premium of 5.25%. This result is summarized below.

Risk Premium Equity Cost Rate
Moul Gas Group

Base Yield	**6.00%**
Risk Premium	**5.25%**
RP Cost Rate	**11.25%**
Flotation Cost Adjustment	**0.22**
RP Equity Cost Rate	**11.47%**

Q120. PLEASE DISCUSS THE BASE YIELD OF MR. MOUL'S RP ANALYSIS.

A120. The base yield in Mr. Moul's RP analysis is the prospective yield on long-term, 'A' rated public utility bonds. Using the yield on these securities inflates the required return on equity for the Company in two ways: (1) long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest payments) are not fixed but tend to increase over time; and (2) the base yield in Mr. Moul's risk premium study is subject to credit risk since it is not default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and therefore, is above its expected return. Hence, using a bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

Q121. PLEASE REVIEW MR. MOUL'S RP STUDY.

A121. Mr. Moul performs a historical RP study that appears in Attachment PRM-12 and Appendix H of his direct testimony. This study involves an assessment of the historical differences between S&P Public Utility Index stock returns and public utility bond returns over various time periods between the years 1928-2007. Mr. Moul evaluates the stock-bond return differentials using different measures of central tendency (the geometric and arithmetic means and the median) over four alternative time intervals (1928-2007, 1952-2007, 1974-2007, and 1979-2007). From the results of his study, he concludes that an appropriate risk premium for the S&P Public Utilities is 5.72%. To recognize the lower risk of gas distribution companies, he arbitrarily adjusts this figure downwards to 5.25%.

Q122. WHAT IS YOUR ASSESSMENT OF THE RISK PREMIUM IN MR. MOUL'S RP APPROACH?

A122. The errors associated with computing an expected equity risk premium using historical stock and bond returns was addressed at length earlier in my testimony. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the 'Peso Problem'), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing).

Q123. TO CONCLUDE THIS DISCUSSION, PLEASE SUMMARIZE MR. MOUL'S RISK PREMIUM AND CAPM RESULTS IN LIGHT OF THE EVIDENCE ON RISK PREMIUMS IN TODAY'S MARKETS.

A123. Both Mr. Moul's RP and CAPM methods are effectively risk premium approaches to estimating equity cost rates. In both approaches, Mr. Moul employs equity risk premiums that are well in excess of the equity risk premium estimates (a) discovered in recent academic studies by leading finance scholars and (b) employed by leading investment banks, management consulting firms, financial forecasters and corporate CFOs.

G. Comparable Earnings Approach

Q124. PLEASE DISCUSS MR. MOUL'S CE ANALYSIS.

A124. In pages 51 through 54 of his testimony, Attachment PRM-14, and Appendix J, Mr. Moul estimates an equity cost rate for the Company employing the CE approach. His methodology involves averaging historic and prospective returns on common equity for a proxy group of non-utility companies comparable in risk to his proxy group as determined from screening *Value Line's* Value Screen database. Mr. Moul screens the database on six risk measures and arrives at a group of thirty-one unregulated comparable companies. The average of the historic and projected median returns on common equity for the group is 13.9%.

This approach is fundamentally flawed for several reasons. Mr. Moul has not performed any analysis to examine whether his return on equity figures are likely

measures of long-term earnings expectations. More importantly, since Mr. Moul has not evaluated the market-to-book ratios for these companies, he cannot indicate whether the past and projected returns on common equity are above or below investors' requirements. These returns on common equity are excessive if the market-to-book ratios for these companies are above 1.0. For example, Pitney Bowes is one of the companies 'comparable' to the Company. The average return on equity of Pitney Bowes Campbell Soup is 82.5%, and it is used by Mr. Moul in his CE to arrive at the equity cost rate for Columbia. However, I doubt if any financial analyst, including Mr. Moul, would suggest that Pitney Bowes has an equity cost rate of 82.5%. Indeed, the market-to-book ratio for the company is in excess of 10.0. This indicates that its return on equity is well above its cost of equity capital.

IX. CRITIQUE OF STAFF REPORT

Q125. PLEASE SUMMARIZE THE COST OF CAPITAL STUDY PERFORMED BY THE STAFF OF THE PUBLIC UTILIIES COMMISSION OF OHIO.

A125. The Staff's cost of capital recommendation for Columbia is summarized in the table below.

Staff Report Rate of Return

	Capital Ratios	Cost Rate	Weighted Cost Rate
Debt	**49.29%**	**5.78%**	**2.85%**
Common Equity	**50.71%**	**9.95%-10.96%**	**5.05%-5.56%**
Total	**100.00%**		**7.89%-8.41%**

The Staff uses a proxy group of six companies:

AGL Resources	ATO
Atmos Energy Corp.	ATG
CentrePoint Energy	CNP
New Jersey Resources	NJR
Sempra Energy	SRE
WGL Holdings	WGL

The biggest issue with this group is that CNP and SRE are considered integrated gas companies as opposed to pure gas distribution companies.

The Staff recommends a hypothetical capital structure which is the average book value capital structure of the six companies in the Staff's proxy group and includes a common equity ratio of 50.71%. The Staff uses a long-term debt cost rate of 5.78%. The Staff's equity cost rate range of Staff uses range of 9.95% to 10.96% is the average of their DCF and CAPM results, adjusted for flotation costs. The Staff arrives at this range in the following manner. The Staff's recommendation is based on the average of their CAPM (9.98%) and DCF (10.72%) results, which is 10.35%. The Staff uses a 100 basis point range (+/- 50 BPs) around this result, to arrive at a range of 9.85% to 10.85%. The Staff then applies a flotation cost adjustment factor of 1.01019 to this range to arrive at the final recommended range of 9.95% to 10.96%.

The Staff's Equity cost rate approaches are summarized below:

CAPM Approach – 9.98%

Rf	4.24%	Average of 10- and 30- year Treasuries
Beta	0.883	Value Line
Equity RP	6.5%	Ibbotson arithmetic means

DCF Approach – 10.26%

Staff uses a non-constant DCF model applied to each of the five proxy companies using:

Dividends	Sum of past four quarters
Stock Price	One-year average annual stock price
Years 1-5 Growth Rate	Average of projected EPS growth from Reuters, Yahoo, MSN, and Value Line
Years 6-25 Growth Rate	Linear change from Years 1-5 growth rate to Year 25- growth rate
Years 25- Growth Rate	Long-term growth rate in GNP from 1929-2005 as provided by US Dept. of Commerce

Q126. PLEASE PROVIDE YOUR ASSESSMENT OF THE STAFF'S COST OF CAPITAL STUDY.

A126. The errors in the Staff's cost of capital study include:

CAPM

The primary error in the staff's CAPM analysis is the equity risk premium of 6.5% which is the Ibbotson historic equity risk premium which is based on the difference in the arithmetic mean stock and bond returns between 1926 and 2007. As discussed at length above, this approach is subject to a myriad of empirical errors which make

these historical returns poor measures of expected returns. As discussed earlier in my testimony, the use of historical return to estimate an expected risk premium can be erroneous 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. Furthermore, there are a number of flaws in using historical returns over long time periods to estimate expected equity risk premiums. These issues, as discussed in my testimony, include: (1) historical bond returns are downward biased; (2) there are measurement problems with the arithmetic mean return; (3) there is a very large measurement error is the equity risk premium measured using historical stock and bond returns; (4) historical stock returns are unattainable and upwardly biased; (5) historic stock returns include only companies that have survived ("survivorship bias"); (6) the stock market in the U.S. in the twentieth century was extremely successful and did not suffer the calamities of other markets around the world ("Peso Problem"); (7) capital market conditions today are significantly different than they were in the past; and (8) the relative risk of stocks and bonds have changed over time, with stocks becoming less risky and bonds becoming more risky.

In sum, the Staff makes the same error as Mr. Moul by using an equity risk premium based on historical stock and bond returns. This approach is outdated, ignores twenty years of academic and professional research on the equity risk

premium, and is inconsistent with the real world of finance. As indicated earlier in my testimony, investment banks, consulting firms, and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions and their research indicates an equity risk premium in the 4 percent range is appropriate.

DCF

There are two errors in the Staff's DCF analysis. First, the Staff uses a Year 1-5 DCF growth rate equal to the average of projected EPS growth from Reuters, Yahoo, MSN, and *Value Line.* I provide ample evidence earlier in my testimony that the projected EPS growth rate forecasts of Wall Street analysts (as provided by Reuters, Yahoo, MSN) and *Value Line* are upwardly biased measures of future earnings. As such, using these growth rates as the expected growth provides an overstated DCF equity cost rate. Second, the Staff had provided no theoretical or empirical support to justify using the projected GNP growth rate as the expected DCF growth rate for years 25 and forward. Without theoretical or empirical support, there is no reason for investors to expect GNP growth to reflect the expected long-term dividend and earnings growth rate for gas companies.

Flotation Costs

The error in adjusting an equity cost rates for flotation costs was discussed on pages 78-81 of this testimony.

The Impact of the SFV Rate Design and IRP Rider Flotation Costs

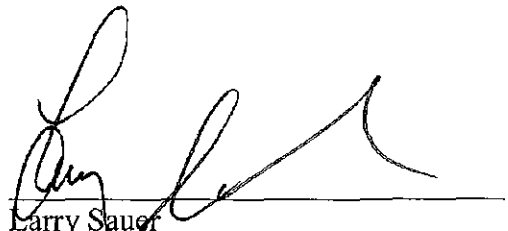
The Staff Report recognizes that the adoption of the SFV rate design and IRP rider would reduce the business and regulatory risk of Columbia. However, the Staff Report makes no downward adjustment to its recommended return on equity recommendation to reflect the lower risk.

Q127. DOES THIS CONCLUDE YOUR TESTIMONY?

A127. Yes. However, I reserve the right to incorporate new information that may subsequently become available. I also reserve the right to supplement my testimony in response to positions taken by the PUCO Staff.

CERTIFICATE OF SERVICE

It is hereby certified that a true copy of the foregoing the *Direct Testimony of Dr. J. Randall Wooldridge, PhD. on Behalf of the Office of the Ohio Consumers' Counsel* has been served electronically and via First Class US Mail , this 25th day of September, 2008.



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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).

Appendix B
ROE Adjustments Associated with Commission's Adoption of
Decoupling and/or Rate Design Mechanisms

Jurisdiction	Company	Docket/Case	Proposed Change to Rate Structure	Adjustment
Arkansas	Arkansas Western Gas Co.	06-124-U	Billing Determinant Rate Adjustment Tariff (BDA Tariff)	A Settlement was approved by the Commission. The Settling Parties accept Staff's recommended BDA Tariff, including a return on equity of 9.5%.
Arkansas	CenterPoint Energy Arkla	04-121-U	Load Change Adjustment Rider	0.35 adjustment to rate of return
Arizona	Southwest Gas	G-01551A-04-0876	Conservation Margin Tracker	0.25 reduction to cost of equity; 0.11 reduction to cost of capital
Colorado	Public Service Company of Colorado	05S-264G	Service and Facilities Charge	0.25 reduction to cost of equity
Delaware	Delmarva Power & Light Company	Case No. 9093	Bill Stabilization Adjustment	0.50 reduction to cost of equity due to BSA
Federal Energy Regulatory Commission	Texas Eastern Transmission Corporation	CP87-312-008	Straight Fixed Variable	0.25 reduction to cost of equity
Federal Energy Regulatory Commission	Columbia Gas Transmission Corporation; Columbia Gulf Transmission Company	RP91-161-011, RP92-3-000, RP90-108-016, RP91-82-008, and RS92-5-000 ; RP91-160-000, RP92-2-000, RP90-107-013, and RS92-6-000	Straight Fixed Variable	0.25 reduction to cost of equity

Appendix B
ROE Adjustments Associated with Commission's Adoption of
Decoupling and/or Rate Design Mechanisms

Illinois	Peoples Gas	07-0241/07-024	Rider VBA (volume Balancing Adjustment)	Rider VBA reduces the Utilities' risk, which warrants a reduction in ROE by ten (10) basis points.
Maryland	Delmarva Power & Light Company	9093	Decoupling	50 basis point adjustment for decoupling mechanism
Maryland	Potomac Electric Power Company	9092	Decoupling	50 Basis Point Adjustment for decoupling mechanism
Missouri	MO Gas Energy, (Div. of Southern Union)	GR-2006-0422	Straight Fixed Variable ("SFV") Rate Design	The approved ROE reflects the results of cost of common equity models adjusted downward by 32.5 basis points for the reduced risk associated with a straight fixed variable rate design.
Nevada	Southwest Gas	04-3011	Margin per Customer Balancing Provision	0.25 reduction to cost of equity
Tennessee	Chattanooga Gas	06-00175	Conservation and Usage Adjustment	0.5 reduction to cost of equity
United States Court of Appeals for the District of Columbia Circuit	United Distribution Companies, Petitioner v. Federal Energy Regulatory Commission, Respondent No. 92-1485	92-1485	Order 636 SFV Rate Design	0.25 reduction to cost of equity
Vermont	Green Mountain Power Corporation	7175 and 7176	Decoupling	50 basis point adjustment for an alternative regulation plan which includes a decoupling mechanism
Washington	Cascade Natural Gas Corporation	UG-060256	Decoupling	8.85% ROR, midpoint range of the Company and Staff, included a risk adjustment.

Exhibit JRW-1

Columbia Gas of Ohio, Inc.
Cost of Capital

Actual at December 31, 2007

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.54%	5.78%	2.92%
Common Equity	49.46%	9.25%	4.58%
Total	100.00%		7.50%

Coverage Ratios

Before-income tax coverage if interest expense based on an effective federal and state tax ir 35.00%	3.4 X
After-income tax coverage of interest expense	2.6 X

Exhibit JRW-2
Columbia Gas of Ohio, Inc.
Summary Financial Statistics

Gas Proxy Group

Company	Symbol	S&P Bond Rating	Market Cap ($B)	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
AGL Resources	ATG	A-	2.5	2,510.0	68%	3,563.0	3.0	GA,VA	44	8.3%	18.1	1.49
Atmos Energy	ATO	BBB	2.5	6,782.7	52%	4,012.9	2.8	LA,KY,TX, CO,KS	49	8.4%	14.3	1.17
Laclede Group, Inc.	LG	A	1.0	2,117.8	53%	813.1	3.0	MO	57	13.2%	16.9	2.12
New Jersey Resources	NJR	A+	1.5	3,244.3	33%	990.4	4.8	NJ,Canada	55	NM	NM	2.27
Nicor, Inc.	GAS	AA	2.1	3,437.3	84%	2,759.6	5.9	IL	65	14.3%	14.9	2.07
Northwest Natural Gas Company	NWN	A-	1.3	1,026.8	98%	1,443.8	4.0	OR,WA	52	11.0%	18.4	2.02
Piedmont Natural Gas, Inc.	PNY	A	2.1	1,925.1	82%	2,191.6	4.0	NC,SC,TN	51	12.1%	18.4	2.21
South Jersey Industries	SJI	A	1.1	936.0	62%	956.9	3.3	NJ	56	12.6%	17.2	2.09
Southwest Gas	SWX	BBB-	1.3	2,172.0	84%	2,866.6	2.3	AZ,NV,CA	46	8.3%	15.5	1.24
WGL Holdings, Inc.	WGL	AA-	1.6	2,564.8	59%	2,168.7	5.7	DC,MD,VA	58	12.2%	12.7	1.51
Mean		A	1.7	2,671.7	68%	2,176.7	3.9		53	11.2%	16.3	1.82

Data Source: AUS *Utility Reports*, September, 2008; Market Cap, Service Area, and Pre-Tax Interest Coverage is from *Value Line Investment Survey*, 2008.

Exhibit JRW-3
Columbia Gas of Ohio, Inc.
Capital Structure Ratios

Panel A - Columbia Recommended Capitalization Ratios

Capital	Capitalization Ratios
Long-Term Debt	50.54%
Common Equity	49.46%
Total Capital	100.00%

Testimony of Paul R. Moul

Panel B - Gas Proxy Group - Capitalization Ratios

Capital	Capitalization Ratios			
	12/31/07	9/30/07	6/30/07	3/31/07
Short Term Debt	7.98%	7.07%	5.79%	4.77%
Long-Term Debt	41.34%	42.33%	42.66%	42.68%
Preferred Stock	0.18%	0.20%	0.01%	0.01%
Common Equity	50.51%	50.42%	52.11%	52.54%
Total	100.00%	100.00%	100.00%	100.00%

Panel C - Gas Proxy Group
Four-Quarter Average Capitalization Ratios

Capital	Capitalization Ratios
Short Term Debt	6.40%
Long-Term Debt	42.25%
Preferred Stock	0.10%
Common Equity	51.39%
Total	100.15%

Exhibit JRW-3
Columbia Gas of Ohio, Inc.
Capital Structure Ratios
Gas Proxy Group

		12/31/07	9/30/07	6/30/07	3/31/07
ATG					
	Short Term Debt	598,000	576,000	339,000	111,000
	Long-Term Debt	1,674,000	1,548,000	1,544,000	1,623,000
	Preferred Stock				
	Common Equity	1,661,000	1,623,000	1,672,000	1,678,000
	Total	3,933,000	3,747,000	3,555,000	3,412,000
ATO					
	Short Term Debt	205,862	154,430	303,992	303,232
	Long-Term Debt	2,124,915	2,126,315	2,126,526	1,878,331
	Preferred Stock				
	Common Equity	2,032,483	1,965,754	1,988,142	2,021,953
	Total	4,363,260	4,246,499	4,418,660	4,203,516
LG					
	Short Term Debt	160	40,160	40,160	40,160
	Long-Term Debt	355,538	355,522	355,501	355,482
	Preferred Stock	627	627	627	627
	Common Equity	440,397	428,325	434,876	430,191
	Total	796,722	824,634	831,164	826,460
NJR					
	Short Term Debt	387,968	340,060	336,904	238,081
	Long-Term Debt	399,639	421,269	377,023	381,022
	Preferred Stock				
	Common Equity	668,969	644,797	671,550	652,805
	Total	1,456,576	1,406,126	1,385,477	1,271,908
GAS					
	Short Term Debt	444,000	237,000		107,000
	Long-Term Debt	422,800	423,300	497,600	497,500
	Preferred Stock	600		600	600
	Common Equity	945,200	908,800	916,300	913,100
	Total	1,812,600	1,569,100	1,414,500	1,518,200
NWN					
	Short Term Debt	22,732	33,773	18,115	18,947
	Long-Term Debt	516,082	522,919	523,585	520,108
	Preferred Stock				
	Common Equity	594,751	584,956	610,277	630,367
	Total	1,133,565	1,141,648	1,151,977	1,169,422
PNY					
	Short Term Debt				
	Long-Term Debt	824,773	824,887	825,000	825,000
	Preferred Stock				
	Common Equity	921,125	878,374	900,437	924,364
	Total	1,745,898	1,703,261	1,725,437	1,749,364
SJI					
	Short Term Debt	17,953	14,530	15,422	16,092
	Long-Term Debt	364,570	361,768	364,191	362,849
	Preferred Stock				
	Common Equity	481,080	472,379	470,784	463,289
	Total	863,603	848,677	850,397	842,230
SWX					
	Short Term Debt	47,079	36,937	29,821	27,501
	Long-Term Debt	1,366,067	1,327,606	1,303,901	1,315,182
	Preferred Stock				
	Common Equity	983,673	941,604	954,114	952,000
	Total	2,396,819	2,306,147	2,287,836	2,294,683
WGL					
	Short Term Debt	46,094	21,094	31,075	31,075
	Long-Term Debt	593,513	616,419	605,364	605,099
	Preferred Stock	28,173	28,173		
	Common Equity	1,041,428	980,767	1,008,872	1,008,105
	Total	1,709,208	1,646,453	1,645,311	1,644,279

		12/31/07	9/30/07	6/30/07	3/31/07
ATG					
	Short Term Debt	15.20%	15.37%	9.54%	3.25%
	Long-Term Debt	42.56%	41.31%	43.43%	47.57%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	42.23%	43.31%	47.03%	49.18%
	Total	100.00%	100.00%	100.00%	100.00%
ATO					
	Short Term Debt	4.72%	3.64%	6.88%	7.21%
	Long-Term Debt	48.70%	50.07%	48.13%	44.68%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	46.58%	46.29%	44.99%	48.10%
	Total	100.00%	100.00%	100.00%	100.00%
ATO					
	Short Term Debt	0.02%	4.87%	4.83%	4.86%
	Long-Term Debt	44.63%	43.11%	42.77%	43.01%
	Preferred Stock	0.08%	0.08%	0.08%	0.08%
	Common Equity	55.28%	51.94%	52.32%	52.05%
	Total	100.00%	100.00%	100.00%	100.00%
NJR					
	Short Term Debt	26.64%	24.18%	24.32%	18.72%
	Long-Term Debt	27.44%	29.96%	27.21%	29.96%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	45.93%	45.86%	48.47%	51.32%
	Total	100.00%	100.00%	100.00%	100.00%
GAS					
	Short Term Debt	24.50%	15.10%	0.00%	7.05%
	Long-Term Debt	23.33%	26.98%	35.18%	32.77%
	Preferred Stock	0.03%	0.00%	0.04%	0.04%
	Common Equity	52.15%	57.92%	64.78%	60.14%
	Total	100.00%	100.00%	100.00%	100.00%
NWN					
	Short Term Debt	2.01%	2.96%	1.57%	1.62%
	Long-Term Debt	45.53%	45.80%	45.45%	44.48%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	52.47%	51.24%	52.98%	53.90%
	Total	100.00%	100.00%	100.00%	100.00%
PNY					
	Short Term Debt	0.00%	0.00%	0.00%	0.00%
	Long-Term Debt	47.24%	48.43%	47.81%	47.16%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	52.76%	51.57%	52.19%	52.84%
	Total	100.00%	100.00%	100.00%	100.00%
SJI					
	Short Term Debt	2.08%	1.71%	1.81%	1.91%
	Long-Term Debt	42.21%	42.63%	42.83%	43.08%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	55.71%	55.66%	55.36%	55.01%
	Total	100.00%	100.00%	100.00%	100.00%
SWX					
	Short Term Debt	1.96%	1.60%	1.30%	1.20%
	Long-Term Debt	57.00%	57.57%	56.99%	57.31%
	Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	41.04%	40.83%	41.70%	41.49%
	Total	100.00%	100.00%	100.00%	100.00%
WGL					
	Short Term Debt	2.70%	1.28%	1.89%	1.89%
	Long-Term Debt	34.72%	37.44%	36.79%	36.80%
	Preferred Stock	1.65%	1.71%	0.00%	0.00%
	Common Equity	60.93%	59.57%	61.32%	61.31%
	Total	100.00%	100.00%	100.00%	100.00%

Summary	12/31/07	9/30/07	6/30/07	3/31/07
Short Term Debt	7.98%	7.07%	5.21%	4.77%
Long-Term Debt	41.34%	42.33%	42.66%	42.68%
Preferred Stock	0.18%	0.18%	0.01%	0.01%
Common Equity	50.51%	50.42%	52.11%	52.54%
Total	100.00%	100.00%	100.00%	100.00%

Exhibit JRW-4

Long-Term 'A' Rated Public Utility Bonds

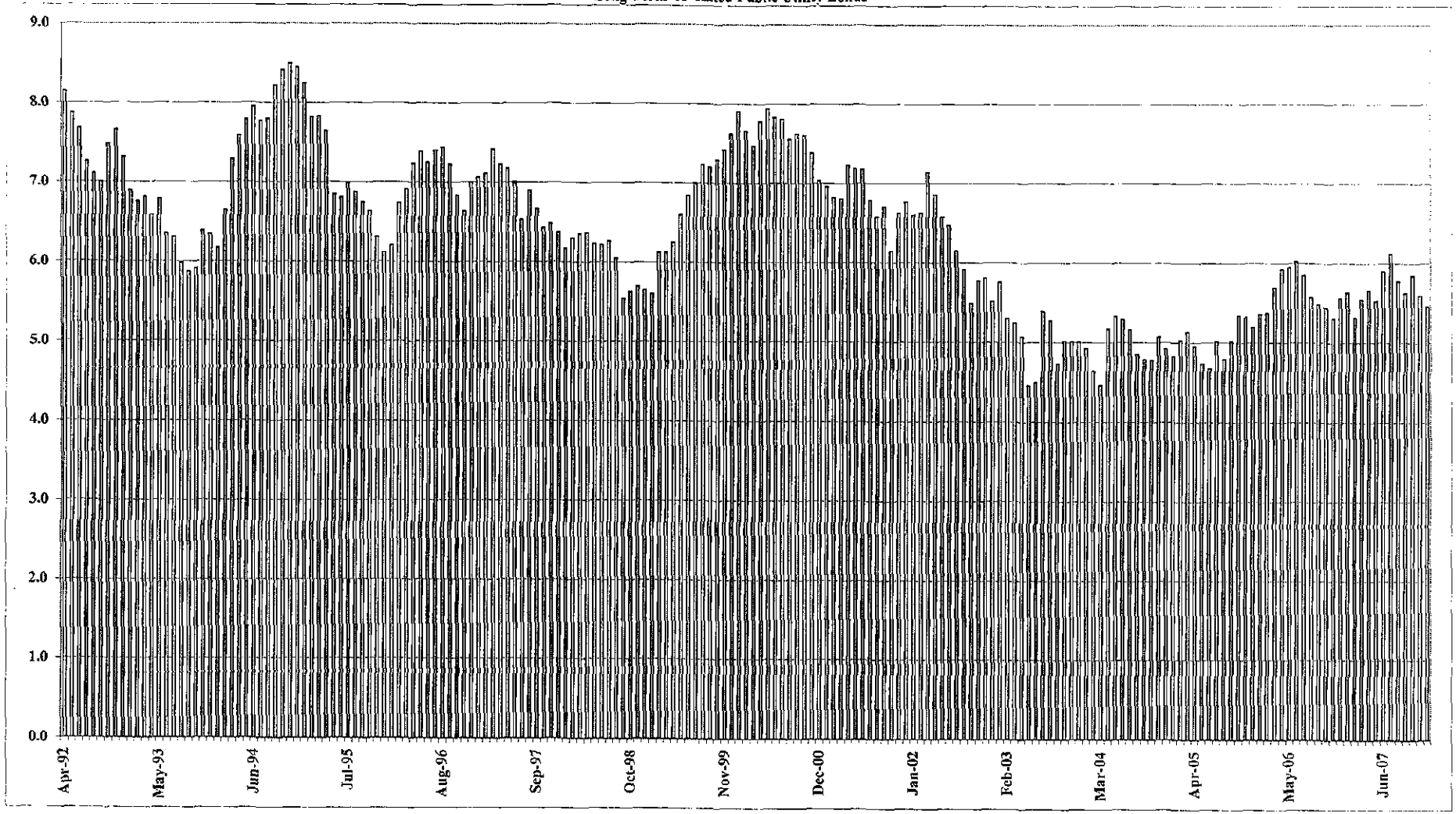
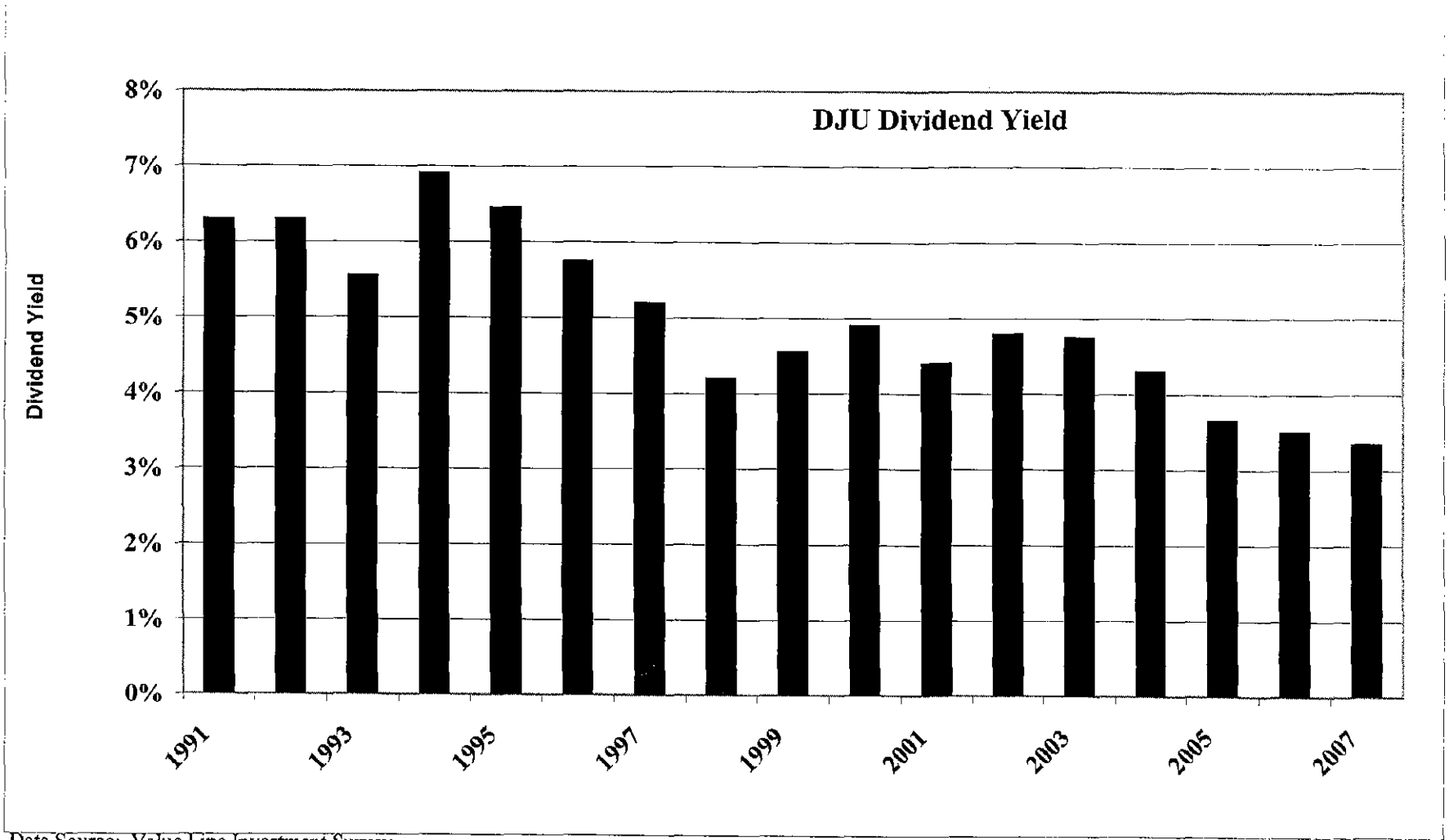


Exhibit JRW-4

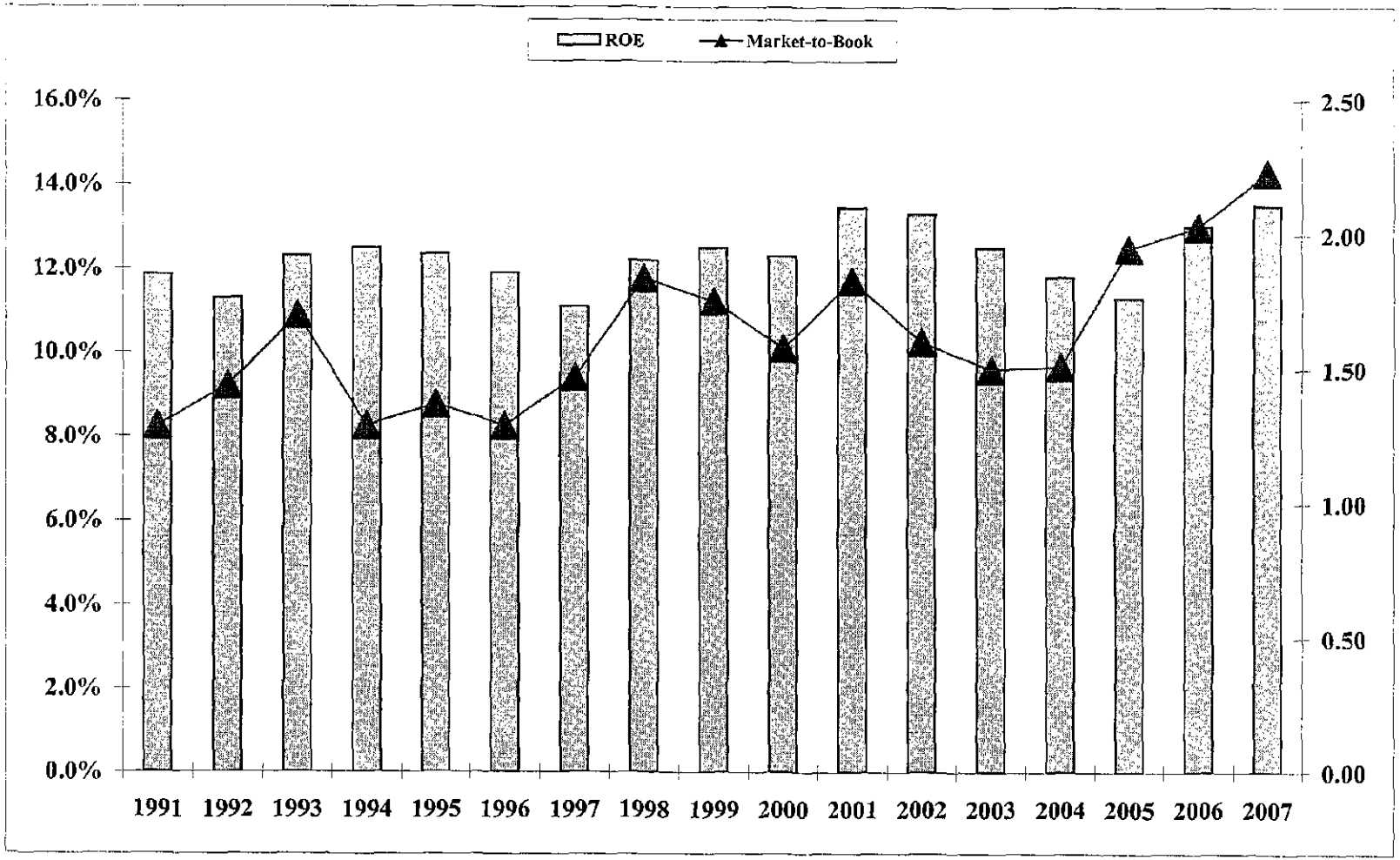
Dow Jones Utilities Dividend Yield



Data Source: Value Line Investment Survey

Exhibit JRW-4

Dow Jones Utilities - Market to Book and ROE



Data Source: Value Line Investment Survey

Exhibit JRW-5

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
						Total/Average	7364	1.24

Data Source: http://pages.stern.nyu.edu/~adamodar/

Exhibit JRW-6

Columbia Gas of Ohio, Inc.
Discounted Cash Flow Analysis

Gas Proxy Group

Dividend Yield*	**4.0%**
Adjustment Factor	**1.0275**
Adjusted Dividend Yield	**4.1%**
Growth Rate**	**5.5%**
Equity Cost Rate	**9.6%**

*** Page 2 of Exhibit JRW-6**

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

Exhibit JRW-6

Columbia Gas of Ohio, Inc.
Monthly Dividend Yields
April- September 2008

Gas Proxy Group

Company	Apr	May	June	July	Aug	Sep	Mean
AGL Resources	4.9%	4.7%	4.6%	4.9%	5.0%	5.1%	4.9%
Atmos Energy	5.1%	4.8%	4.6%	4.8%	5.1%	4.7%	5.1%
Laclede Group, Inc.	4.2%	4.1%	3.6%	3.7%	3.9%	3.2%	4.2%
New Jersey Resources	3.6%	3.4%	3.3%	3.3%	3.5%	3.1%	3.6%
Nicor Inc.	5.7%	5.2%	4.7%	4.3%	4.8%	4.2%	5.7%
Northwest Natural Gas Company	3.6%	3.3%	3.4%	3.2%	3.4%	3.1%	3.6%
Piedmont Natural Gas, Inc.	4.0%	3.8%	3.9%	3.8%	4.2%	3.7%	4.0%
South Jersey Industries	3.1%	2.9%	2.8%	2.8%	2.9%	3.1%	3.1%
Southwest Gas	3.3%	3.0%	2.9%	2.9%	3.2%	3.0%	3.3%
WGL Holdings, Inc.	4.4%	4.2%	4.0%	4.0%	4.2%	4.3%	4.4%
Mean	4.2%	3.9%	3.8%	3.8%	4.0%	3.8%	4.2%

Data Source: AUS *Utility Reports*, monthly issues

Exhibit JRW-6

Columbia Gas of Ohio, Inc.
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Gas Proxy Group

Company	Sym	*Value Line* Historic Growth					
		Past 10 Years			Past 5 Years		
		Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
AGL Resources	ATG	7.0%	2.5%	6.5%	15.0%	4.0%	10.5%
Atmos Energy	ATO	3.5%	2.5%	7.0%	7.5%	1.5%	9.0%
Laclede Group, Inc.	LG	3.0%	1.0%	3.0%	9.5%	1.0%	4.5%
New Jersey Resources	NJR	6.5%	3.5%	7.5%	6.0%	4.0%	10.0%
Nicor Inc.	GAS	1.5%	3.5%	3.0%	-1.5%	1.0%	4.0%
Northwest Natural Gas Company	NWN	3.0%	1.5%	3.5%	6.5%	2.0%	3.5%
Piedmont Natural Gas, Inc.	PNY	5.0%	5.0%	6.0%	6.0%	4.5%	6.5%
South Jersey Industries	SJI	9.5%	2.5%	7.5%	12.5%	4.5%	12.5%
Southwest Gas	SWX	12.0%	0.0%	3.0%	6.0%	0.0%	3.5%
WGL Holdings, Inc.	WGL	2.0%	1.5%	4.0%	5.0%	1.5%	3.5%
Mean		5.3%	2.4%	5.1%	7.3%	2.4%	6.8%
Median		4.3%	2.5%	5.0%	6.3%	1.8%	5.5%
		Average of Mean and Median I			4.5%		

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

Exhibit JRW-6

Columbia Gas of Ohio, Inc.
DCF Equity Cost Growth Rate Measures
Value Line Projected Growth Rates

Gas Proxy Group

Company	Sym	*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
AGL Resources	ATG	3.0%	4.0%	1.5%	14.0%	41.0%	5.7%
Atmos Energy	ATO	4.5%	2.0%	3.5%	9.5%	42.0%	4.0%
Laclede Group, Inc.	LG	4.5%	2.5%	5.5%	11.5%	44.0%	5.1%
New Jersey Resources	NJR	8.5%	6.0%	9.0%	12.5%	52.0%	6.5%
Nicor Inc.	GAS	5.0%	0.0%	5.0%	14.0%	49.0%	6.9%
Northwest Natural Gas Company	NWN	7.0%	5.5%	3.5%	11.0%	44.0%	4.8%
Piedmont Natural Gas, Inc.	PNY	7.0%	4.0%	4.0%	13.0%	40.0%	5.2%
South Jersey Industries	SJI	6.0%	5.5%	3.5%	16.5%	58.0%	9.6%
Southwest Gas	SWX	7.5%	4.0%	4.0%	9.5%	69.0%	6.6%
WGL Holdings, Inc.	WGL	3.5%	2.5%	5.0%	10.5%	39.0%	4.1%
Mean		5.7%	3.6%	4.5%	12.2%	47.8%	5.8%
Median		5.5%	4.0%	4.0%	12.0%	44.0%	5.5%
Average of Mean and Median Figures =			4.5%			Average =	5.7%

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

Exhibit JRW-6

Columbia Gas of Ohio, Inc.
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Gas Proxy Group

Company	Sym	Yahoo First Call	Zack's	Average
AGL Resources	ATG	5.25%	4.80%	5.0%
Atmos Energy	ATO	5.00%	5.40%	5.2%
Laclede Group, Inc.	LG	3.50%	10.00%	6.8%
New Jersey Resources	NJR	6.00%	8.00%	7.0%
Nicor Inc.	GAS	4.25%	5.80%	5.0%
Northwest Natural Gas Compan	NWN	4.83%	6.50%	5.7%
Piedmont Natural Gas, Inc.	PNY	5.75%	5.60%	5.7%
South Jersey Industries	SJI	6.67%	7.80%	7.2%
Southwest Gas	SWX	6.00%	8.00%	7.0%
WGL Holdings, Inc.	WGL	4.00%	7.50%	5.8%
Mean		5.1%	6.9%	6.0%

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

Exhibit JRW-7

Capital Asset Pricing Model

Panel A
Gas Proxy Group

Risk-Free Interest Rate	**4.50%**
Beta*	**0.82**
Ex Ante Equity Risk Premium**	**4.60%**
CAPM Cost of Equity	**8.3%**

* See page 2 of Exhibit JRW-7

** See page 3 of Exhibit JRW-7

Exhibit JRW-7

Columbia Gas of Ohio, Inc.
Beta

Gas Proxy Group

Company

Company	Sym	Beta
AGL Resources	ATG	0.85
Atmos Energy	ATO	0.80
Laclede Group, Inc.	LG	0.80
New Jersey Resources	NJR	0.80
Nicor Inc.	GAS	0.90
Northwest Natural Gas Company	NWN	0.75
Piedmont Natural Gas, Inc.	PNY	0.80
South Jersey Industries	SJI	0.80
Southwest Gas	SWX	0.80
WGL Holdings, Inc.	WGL	0.85
Mean		0.82

Exhibit JRW-7

Columbia Gas of Ohio, Inc.
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					4.14%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%		5.37%	
	AVERAGE									3.82%
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)					4.72%	
	AVERAGE									4.98%
OVERALL AVERAGE										4.60%

Exhibit JRW-7

Columbia Gas of Ohio, Inc.

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

Exhibit JRW-7

Columbia Gas of Ohio, Inc.
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%**

Exhibit JRW-8
Columbia Gas of Ohio, Inc.
Moul Proxy Group
Summary Financial Statistics

Company	Symbol	S&P Bond Rating	Market Cap (SB)	Operating Revenue (Smil)	Percent Electric Revenue	Net Plant (Smil)	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio*	Return on Equity	Price/ Earnings Ratio	Market to Book Ratio
AGL Resources	ATG	A-	2.7	2,510.0		3,563.0	3.7	GA,VA	44	8.3%	18.1	1.49
Consolidated Edison	ED	A	11.6	13,119.0		19,113.0	3.6	NY	49	10.8%	11.7	1.19
CH Energy Group, Inc.	CHG	nr	0.6	1,196.8		891.3	4.2	NY	53	8.3%	14.1	1.16
New Jersey Resources	NJR	A+	1.3	3,244.3		990.4	6.0	NJ,Canada	55	NM	NM	2.27
Nicor, Inc.	GAS	AA	1.5	3,437.3		2,759.6	4.6	IL	65	14.3%	14.9	2.07
Northeast Utilities	NU	BBB+	4.3	5,822.2		7,229.9	2.0	CT,NH,MA	43	8.6%	15.3	1.30
NSTAR	NST	AA-	3.4	3,261.8		4,123.3	3.3	MA	40	9.0%	14.6	1.90
Pepco Holdings, Inc.	POM	BBB+	5.1	9,366.4		7,876.7	2.6	DC,MD,VA,NJ	45	8.6%	14.3	1.19
South Jersey Industries	SJI	A	1.0	936.0		956.9	4.8	NJ	56	12.6%	17.2	2.09
WGL Holdings, Inc.	WGL	AA-	1.6	2,564.8		2,168.7	5.7	DC,MD,VA	58	12.2%	12.7	1.51
Mean		A-	3.3	4,545.9	#DIV/0!	4,967.3	4.1		51	10.3%	14.8	1.62

Data Source: AUS *Utility Reports*, April, 2008; *Value Line Investment Survey*, 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%.

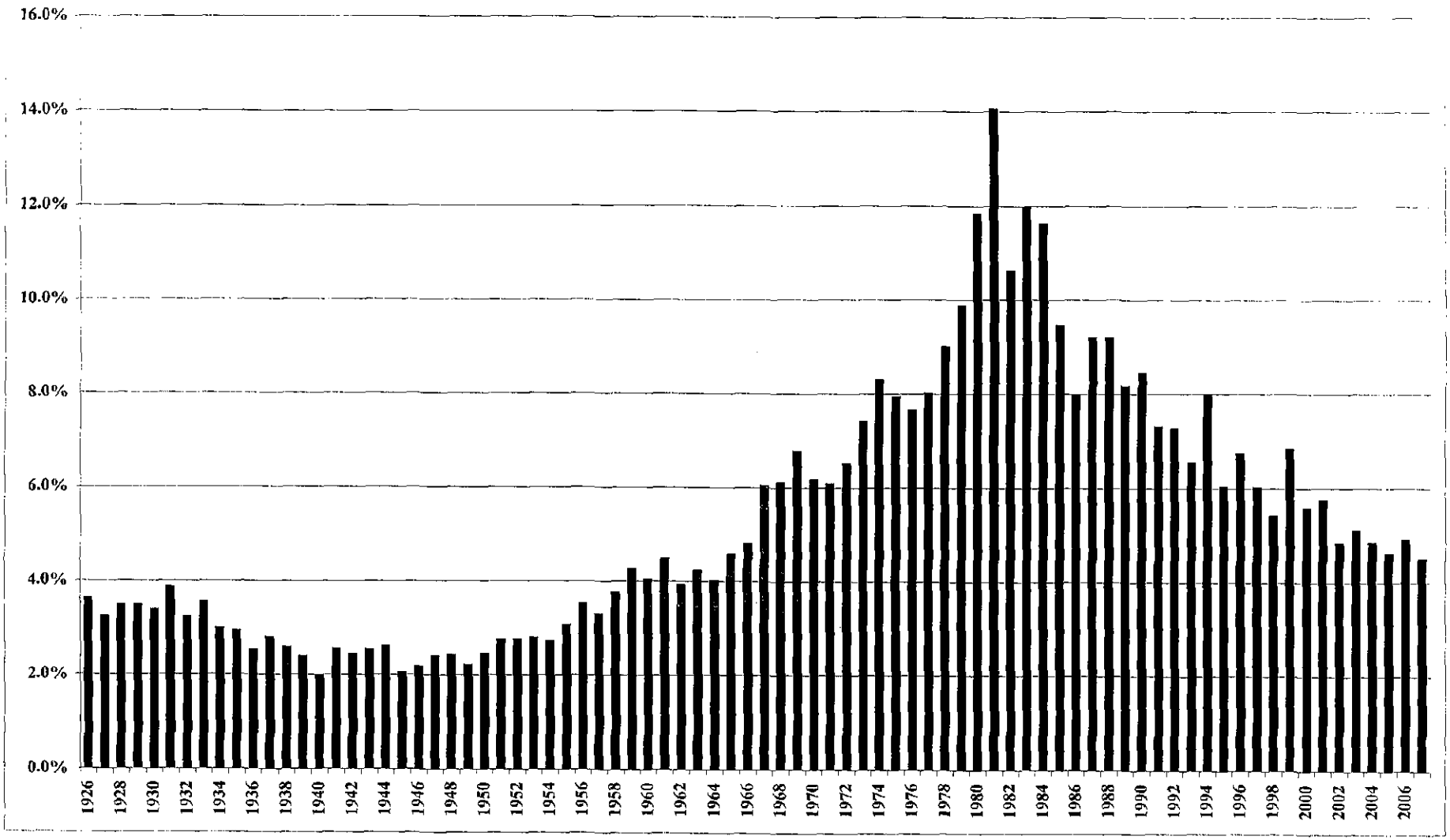
"A significant factor in the upward bias in long-term earnings-rate forecasts is the reluctance of analysts to forecast" profit declines, Mr. Woolridge said. The study found that nearly one-third of all companies experienced profit drops over successive three-to-five-year periods, but analysts projected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

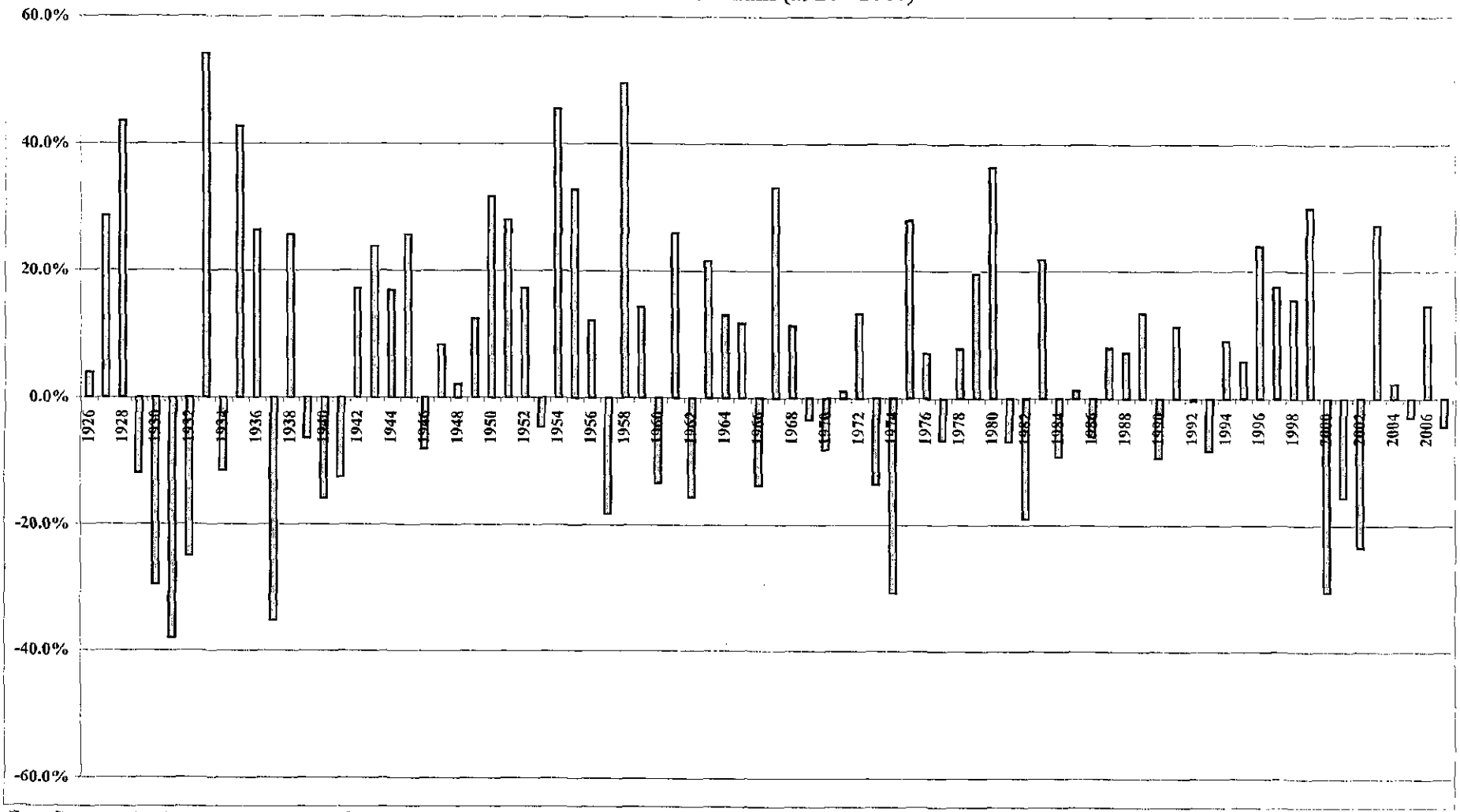
Write to Andrew Edwards at andrew.edwards@dowjones.com

Long-Term U.S. Treasury Yields (1926 - 2007)



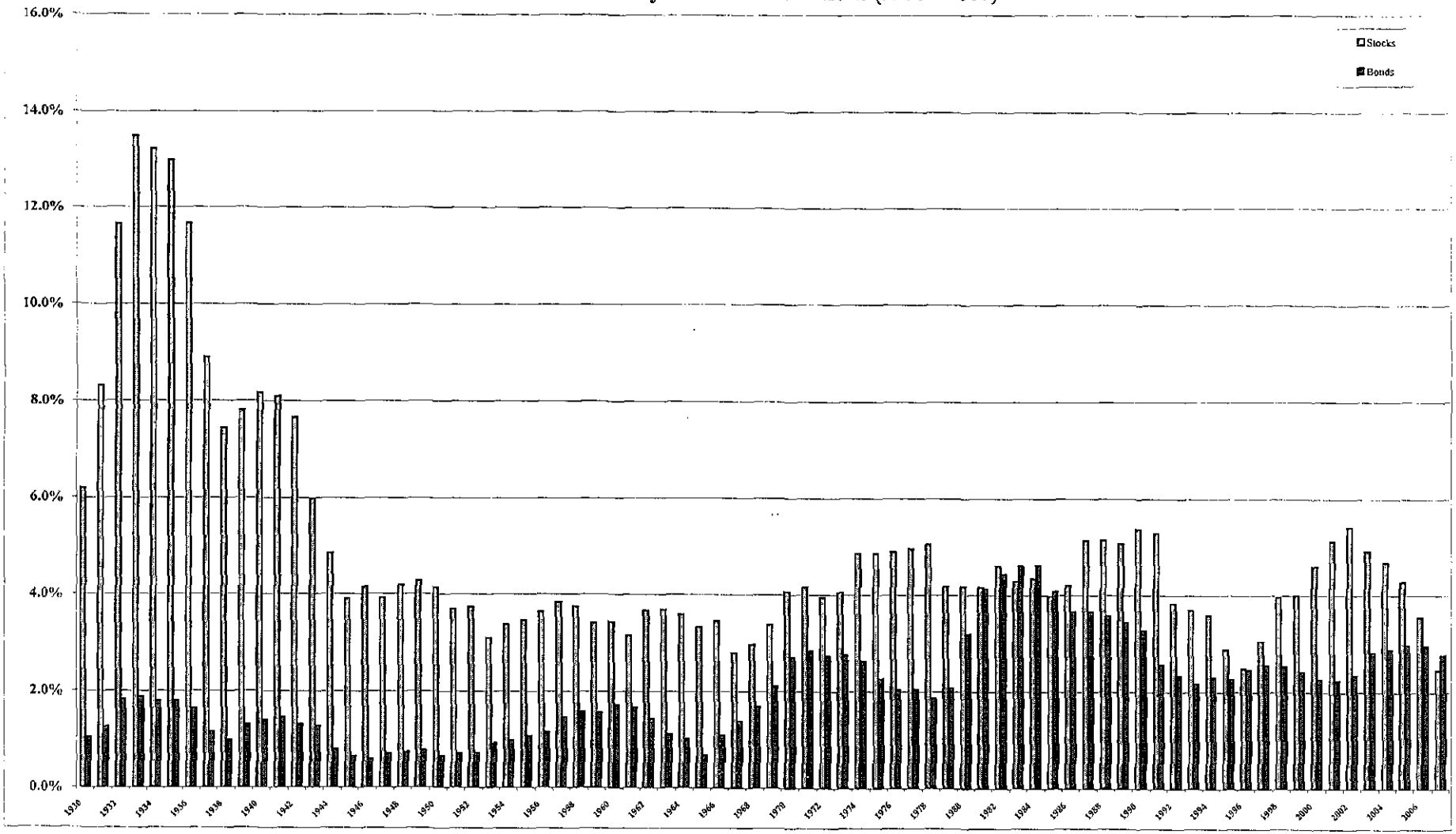
Data Source: Morningstar, *SBBI Yearbook*, 2008.

Market Risk Premium (1926 - 2007)



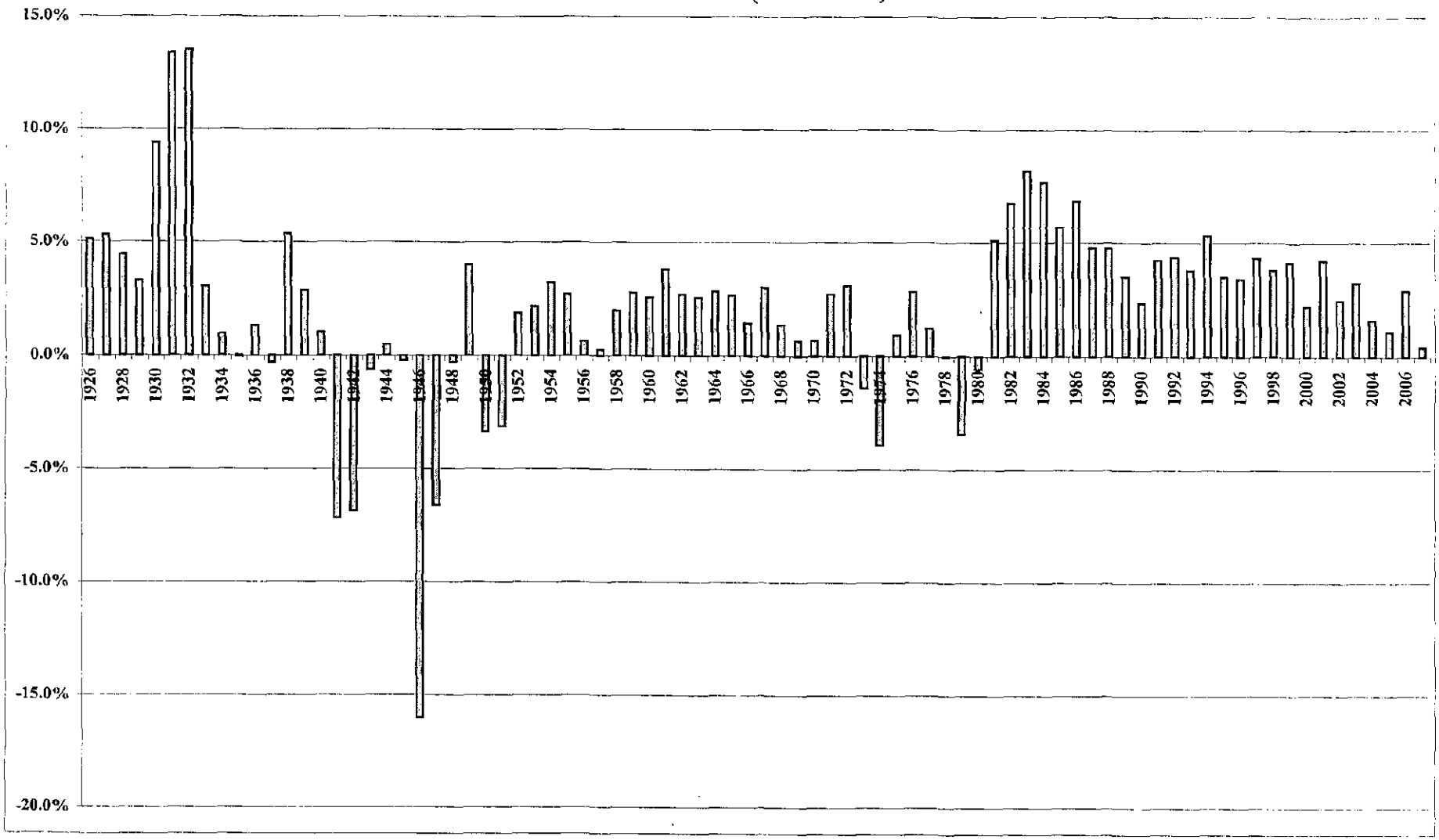
Data Source: Morningstar, *SBBI Yearbook* , 2008.

Stocks and Bonds Monthly Standard Deviations (1930 - 2007)



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

Real Interest Rates (1926 - 2007)



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

Exhibit JRW-11
Value Line Projected Return Study

	Value Line Projected Four-Year Return	S&P 500 Actual One-Year Return	S&P 500 Actual Four-Year Return	Value Line - S&P 500 Four-Year Return
1984	23.30%	6.27%	14.99%	8.31%
1985	20.03%	31.73%	17.69%	2.34%
1986	14.38%	18.67%	17.68%	-3.30%
1987	14.68%	5.25%	11.87%	2.82%
1988	18.67%	16.61%	18.04%	0.63%
1989	16.80%	31.69%	15.69%	1.11%
1990	20.88%	-3.11%	10.62%	10.26%
1991	19.00%	30.47%	11.87%	7.13%
1992	17.70%	7.62%	13.36%	4.34%
1993	14.96%	10.08%	17.20%	-2.24%
1994	15.61%	1.32%	22.96%	-7.35%
1995	15.14%	37.58%	30.51%	-15.37%
1996	13.19%	22.96%	26.39%	-13.20%
1997	13.20%	33.36%	17.20%	-4.00%
1998	9.91%	28.58%	5.66%	4.24%
1999	14.23%	21.04%	-6.78%	21.01%
2000	18.57%	-9.11%	-5.34%	23.91%
2001	17.20%	-11.88%	-0.52%	17.72%
2002		-22.10%		
2003		28.70%		
2004		10.87%		
	Average Projected - Actual Return			3.24%

Data Source: *Value Line Investment Survey*, various issues.

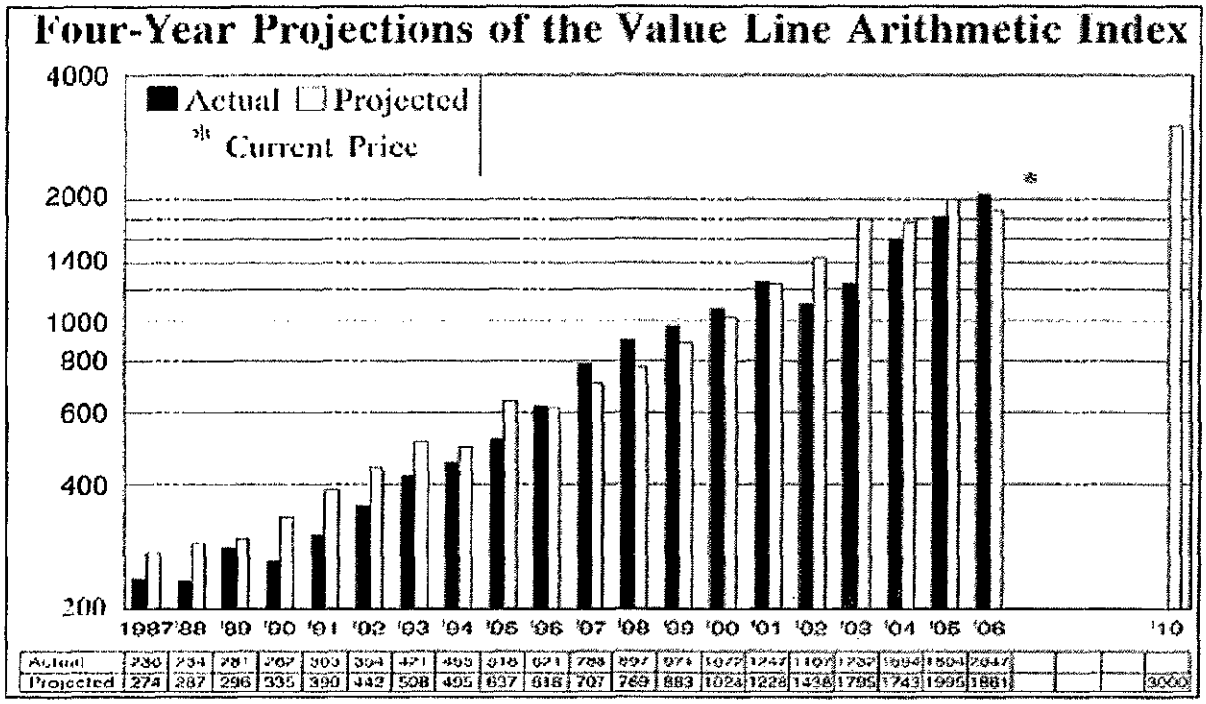
Exhibit JRW-11
Value Line Projected Return Study

	Value Line Projected Four-Year Return	Large Cap Actual One-Year Return	Large Cap Actual Four-Year Return	Value Line - Large Cap Four-Year Return
1984	23.30%	6.27%	15.03%	8.27%
1985	20.03%	32.16%	17.78%	2.25%
1986	14.38%	18.47%	17.63%	-3.25%
1987	14.68%	5.23%	11.85%	2.84%
1988	18.67%	16.81%	18.04%	0.63%
1989	16.80%	31.49%	15.66%	1.14%
1990	20.88%	-3.17%	10.61%	10.27%
1991	19.00%	30.55%	11.87%	7.12%
1992	17.70%	7.67%	13.32%	4.39%
1993	14.96%	9.99%	17.17%	-2.21%
1994	15.61%	1.31%	22.95%	-7.34%
1995	15.14%	37.43%	30.50%	-15.36%
1996	13.19%	23.07%	26.42%	-13.23%
1997	11.56%	33.36%	17.20%	-5.64%
1998	12.26%	28.58%	5.66%	6.60%
1999	15.05%	21.04%	-6.78%	21.83%
2000	18.88%	-9.11%	-5.34%	24.22%
2001	17.16%	-11.88%	-0.52%	17.68%
2002	16.47%	-22.10%	3.92%	12.55%
2003	16.00%	28.70%	14.74%	1.26%
2004	11.60%	10.87%	9.18%	2.42%
2005	11.40%	4.91%		
2006	11.20%	15.80%		
2007	10.60%	5.49%		
	Average Projected - Actual Return			3.64%

Data Source: Value Line Investment Survey, various issues.

Exhibit JRW-11

Value Line Index Projections



Data Source: *Value Line website*.

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/