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President of the Senate

RAY SANSOM
Speaker of the House of Representatives

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J.R. Kelly
Public Counsel

December 18, 2008

Ms. Ann Cole, Commission Clerk
Florida Public Service Commission
2540 Shumard Oak Boulevard
Tallahassee, FL 32399-0870

RE: Docket No. 080318-GU, In re: Petition for rate increase by Peoples Gas Company

Dear Ms. Cole:

Please find enclosed for filing, on behalf of the Citizens of the State of Florida, an original and 15 copies of the Testimonies of Dr. J. Randall Woolridge and Helmuth W. Schultz, III in Docket No. 080318-GU.

Please indicate the time and date of receipt on the enclosed duplicate of this letter and return it to our office.

Sincerely,

Patricia A. Christensen
Associate Public Counsel

COM 5+1
ECR
GCL 1
OPC
RCP 1
SSC 2
SGA
ADM
CLK

Enclosures
PAC:ppg
cc: Parties of Record

CERTIFICATE OF SERVICE
DOCKET NO. 080318-GU

I HEREBY CERTIFY that a true and correct copy of the Direct Testimony of Helmuth W. Schultz, III, and Dr. J. Randall Woolridge has been furnished by hand delivery or U.S. Mail to the following parties on this 18th day of December, 2008.

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BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for rate increase by Peoples Gas

DOCKET NO. 080318-GU

FILED: DECEMBER 18, 2008

/

DIRECT TESTIMONY

OF

DR. J. RANDALL WOOLRIDGE

On Behalf of the Citizens of the State of Florida

J.R. Kelly
Public Counsel

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Attorney for the Citizens
Of the State of Florida

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Petition for rate increase by Peoples Gas

DOCKET NO. 080318-GU

FILED: DECEMBER 18, 2008

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Attorney for the Citizens
Of the State of Florida

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LIST OF EXHIBITS

Q. PLEASE STATE YOUR FULL NAME, ADDRESS, AND OCCUPATION.

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

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Florida Office of Public Counsel ("OPC") to provide an opinion as to the overall fair rate of return or cost of capital for the Peoples Gas System ("Peoples" or "Company") and to evaluate Peoples' rate of return testimony in this proceeding.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First I will review my cost of capital recommendation for Peoples, and review the primary areas of contention between Peoples' rate of return position and OPC's rate of return position. Second, I provide an assessment of capital costs

in today's capital markets. Third, I discuss my proxy group of electric utility companies for estimating the cost of capital for Peoples. 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 Peoples. Finally, I critique Company's rate of return analysis and testimony. I have a table of contents just after the title page for a more detailed outline.

Q. PLEASE REVIEW YOUR RECOMMENDATIONS REGARDING THE APPROPRIATE RATE OF RETURN FOR PEOPLES.

A. I am using the Company's proposed capital structure and 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 an equity cost rate in the range of 7.8%-9.5% for Peoples. I have used an equity cost rate at the upper end of the range, 9.25%, in recognition of the volatile capital market conditions. However, I reserve the right to update my equity cost rate recommendations prior to hearings. This is because, in my opinion, the current market conditions are in disequilibrium as investors attempt to sort out the economic consequences of the collapse of the financial sector and the unprecedented bail out by the U. S. government. In addition, certain financial data have not been updated to reflect the current economic situation. Using the above capital structure and debt and equity cost rates, I am recommending

an overall rate of return of 7.77% for the gas distribution operations of Peoples. These findings are summarized in Exhibit JRW-1.

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

A. Mr. Gordon L. Gillette provides the Company's proposed capital structure and debt cost rates and Dr. Donald A. Murry provides Peoples' proposed common equity cost rate. My analysis suggests that the Company's recommended capital structure with a common equity ratio of 54.7% is equity-heavy when compared to the capitalizations of gas distribution companies. Nonetheless, I am employing the Company's proposed capital structure and debt cost rates. As such, the primary area of contention in this case is the proposed equity cost rate for Peoples. I have adjusted the Company's proposed short-term debt cost rate to reflect market interest rates.

Dr. Murry's equity cost rate estimate is 11.5%, whereas my analysis indicates an equity cost rate of 9.25% is appropriate for Peoples. We have both used DCF and CAPM approaches to estimating an equity cost rate for the Company. Dr. Murry has applied these approaches to a proxy group of gas distribution companies.

In terms of the DCF approaches, the two major areas of disagreement are (1) the relevance of DCF equity cost rate results and (2) the estimation of the expected growth rate. With respect to (1), Dr Murry has ignored the vast majority of his own DCF results for the proxy group in estimating a DCF

equity cost rate range for the Company. In this regard, he argues that he uses the high end of his DCF range to account for flotation costs and market pressure. I demonstrate that this represents an erroneous adjustment since these costs are undocumented and unnecessary. With respect to (2), Dr. Murry has relied exclusively on the forecasted earnings per share growth rates of Wall Street analysts and *Value Line* in estimating a DCF equity cost rate. I have used both historic and projected growth rate measures, and have evaluated growth in dividends, book value, and earnings per share. A very significant factor that I consider and highlight is the upwardly-biased expected earnings growth rates of Wall Street analysts and *Value Line*.

The CAPM approach requires an estimate of the risk-free interest rate, beta, and the equity risk premium. Whereas there is general agreement on the beta and risk-free interest rate, we have significantly different views on the alternative approaches to measuring the equity risk premium as well as the magnitude of equity risk premium. I provide evidence that risk premiums based on historic returns series are subject to a myriad of empirical flaws and, as a result, are upwardly biased measures of expected risk premiums. As I highlight in my testimony, there are three procedures for estimating an equity risk premium – historic returns, surveys, and expected return models. Dr. Murry relies solely on historic measures of the equity risk premium and has used equity risk premiums of 7.10% and 8.50% in his two versions of the CAPM. I provide evidence that risk premiums based on historic returns series are upwardly biased measures of expected risk premiums. I have used an

equity risk premium of 4.78% which (1) uses all three approaches to estimating an equity premium and (2) employs the results of many studies of the equity risk premium. As I note, my equity risk premium is consistent with the equity risk premiums (1) discovered in recent academic studies by leading finance scholars, (2) employed by leading investment banks and management consulting firms, and (3) found in surveys of financial forecasters and corporate CFOs.

Dr. Murry 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 argue that any equity cost rate adjustment based on the relative size of a public utility is inappropriate. One study noted in my testimony tested for a size premium in utilities and concluded that, unlike industrial stocks, utility stocks do not exhibit a significant size premium. The primary reason that a size premium is not required for utilities is that utilities are regulated closely by state and federal agencies and commissions and hence their financial performance is monitored on an on-going basis by agencies of both the state and federal governments.

In the end, the most significant areas of disagreement between Dr. Murry and me with respect to the cost of equity are (1) the relevance of the DCF model and its results in determining an equity cost rate for the Company, and (2) the measurement and magnitude of the equity risk premium.

II. CAPITAL COSTS IN TODAY'S MARKETS

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

A. 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 Exhibit JRW-2 from 1953 to the present. As indicated, prior to the decline in rates that began in the year 2000, the 10-year Treasury yield had not consistently been in the 4-5 percent range over an extended period of time since the 1960s.

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

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

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

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 declined during 1990s 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

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

> 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.[2]

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.

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

A. The mortgage, subprime, and credit crises on Wall Street has led to increased market volatility and the unprecedented actions by the U.S. government to resolve the financial crisis. To assess the impact of recent capital market volatility on the equity risk premium and the equity cost rate, one must look at the volatility of stocks relative to bonds. I have performed such an analysis

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

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").

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

A. I have performed an analysis of the volatility of stocks relative to bonds since 1997. I have used the S&P 500 and the Bear Stearns Bond Price Index ("BSBPI") and computed the CV using a 200-day mean and standard deviation. In Exhibit JRW-5, 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. Through October of this year, stocks have increased in volatility relative to bonds. On the relative CV measure, stocks reached a five-year high in terms of relative volatility. As such, current market conditions suggest that stock volatility is high relative to bond volatility.

III. PROXY GROUP SELECTION

Q. PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF RETURN RECOMMENDATION FOR PEOPLES.

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

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

A. My Gas Proxy Group proxy group consists of nine natural gas distribution companies. These companies met the following selection criteria: (1) listed as a Natural gas Distribution, Transmission, and/or Integrated Gas Company in *AUS Utility Reports*; (2) listed as a Natural Gas Utility in the Standard Edition of the *Value Line Investment Survey*; (3) at least 50% regulated gas revenues; and (4) an investment grade bond rating by Moody's and Standard & Poor's. The companies meeting these criteria include AGL Resource, Atmos Energy, Laclede Group, Nicor, Inc., Northwest Natural Gas Company, Piedmont Natural Gas Company, South Jersey Industries, Southwest Gas, and WGL Holdings. Summary financial statistics for the proxy group are listed in Exhibit JRW-3. The average operating revenues and net plant for the Gas Proxy Group are $2,637.3M and $2,341.5M, respectively. On average, the group receives 72% of revenues from regulated gas operations, has a 'Baa1' Moody's bond rating, a current common equity ratio of 53%, and an earned return on common equity of 10.7%.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. WHAT IS THE RECOMMENDED CAPITAL STRUCTURE OF THE COMPANY?

A. The Company's recommended capital structure is shown in Panel A of page 1 of Exhibit JRW-4. The Company is requesting a capital structure consisting of 0.69% short-term debt, 44.57% long-term debt, and a 54.74% common equity. This is a 2009 test-year capital structure average and includes a number of adjustments.

Q. IS THE COMPANY'S RECOMMENDED CAPITAL STRUCTURE APPROPRIATE FOR PEOPLES?

A. Yes, but with a caveat. Panel B of Exhibit JRW-4 shows the average capital structure ratios for the Company over the past three years. The average common equity ratio over this time period is 58.74%. Panel C of Exhibit JRW-4 shows the average capital structure ratios for the Gas Proxy Group in 2008. The average common equity for the first eleven months of 2008 for the group is 49.9%. Therefore, Peoples' proposed capital structure includes a higher common equity ratio than the average of the Gas Proxy Group Therefore, the caveat is that in making an equity cost rate recommendation, I will recognize that the Company's capitalization includes a higher common

equity ratio, and therefore lesser financial risk, than the average of the Gas Proxy Group.

Q. WHAT SHORT-TERM DEBT COST RATE ARE YOU USING IN THE COST OF CAPITAL FOR PEOPLES?

A. The Company's short-term debt cost rate is based on a short-term debt rate assumption of 4.5%. This rate, in turn, is based on the historic London Interbank Offered Rate ("LIBOR") between 1991-2008 of 4.37% plus a program financing fee. This has very little to do with current LIBOR rates. Page 5 of Exhibit JRW-4 shows LIBOR rates over the past five years. During 2008, LIBOR rates declined to the 2.75% range early in the summer in response to Federal Reserve actions to lower interest rates. These rates increased dramatically to the 4.75% range in September in response to the spreading credit crisis. However, the intervention of the Federal Reserve, the Treasury Department, and U.S. government has resulted in a significant decline in the LIBOR rate. As of December 17, 2008, the three-month LIBOR rate was 1.58%. Including the financing program fee of 18 basis points, I will use a short-term debt cost rate of 1.76% (1.58% + 0.18% = 1.76%).

Q. WHAT LONG-TERM DEBT COST RATE ARE YOU USING IN THE COST OF CAPITAL FOR PEOPLES?

A. I will use the Company's long-term debt cost rate for rate year 2009 of 7.20%.

Q. ARE YOU ADOPTING THE COMPANY'S SHORT-TERM AND LONG-TERM DEBT COST RATES OF 4.5% AND 5.30%?

A. Yes. Not included

V. THE COST OF COMMON EQUITY CAPITAL

A. Overview

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

A. 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).

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

A. 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:[3]

> Fundamentally, the value of a company is determined by the cash flow it generates over time for its owners, and the minimum acceptable rate of return required by capital investors. This "cost of equity capital" is used to discount the expected equity cash flow, converting it to a present value. The cash flow is, in turn, produced by the interaction of a company's return on equity and the annual rate of equity growth. High return on equity (ROE) companies in low-growth markets, such as Kellogg, are prodigious generators of cash flow, while low ROE companies in high-growth markets, such as Texas Instruments, barely generate enough cash flow to finance growth.
>
> A company's ROE over time, relative to its cost of equity, also determines whether it is worth more or less than its book value. If its ROE is consistently greater than the cost of equity capital (the investor's minimum acceptable return), the business is economically profitable and its market value will exceed book value. If, however, the business earns an ROE consistently less than its cost of equity, it is economically unprofitable and its market value will be less than book value.

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

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

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.

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

A. 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:[4]

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

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

To assess the relationship by industry, as suggested above, I have performed a regression study between estimated return on equity and market-to-book ratios using natural gas distribution, electric utility and water utility companies. I used all companies in these three industries which are covered by *Value Line* and who have estimated return on equity and market-to-book ratio data. The results are presented in Panels A-C of Exhibit JRW-6. The

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

average R-squares for the electric, gas, and water companies are 0.65, 0.60, and 0.92.[5] This demonstrates the strong positive relationship between ROEs and market-to-book ratios for public utilities.

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

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

Average earned returns on common equity and market-to-book ratios are given on page 3 of Exhibit JRW-7. Over the past decade, earned returns on common equity have consistently been in the 11.0%-13.0% range. The average ROE peaked at 13.45% in 2001 and subsequently declined through

[5] 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.

the year 2006 before recovering in 2007. Over the past decade, market-to-book ratios for this group have increased gradually but with several ups and downs. The market-to-book average was 1.83 as of 2001, declined to 1.50 in 2003 and increased to 2.2 as of 2007.

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

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

A. 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.

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

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

Exhibit JRW-8 provides an assessment of investment risk for 100 industries as measured by beta, which according to modern capital market theory is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey* and are compiled by Aswath Damodoran of New York University.[6] The study shows that the investment risk of public utilities is relatively low. The average beta for gas distribution companies is 0.78. This figure put gas companies 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.

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

A. 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

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

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.

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

A. 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

Q. DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF MODEL.

A. 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.

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

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

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

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

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

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

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

A. 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:

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

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

A. 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.

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

A. 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.

Q. PLEASE DISCUSS EXHIBIT JRW-10.

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

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

A. The dividend yields on the common stock for the companies in the proxy group are provided on page 2 of Exhibit JRW-10 for the six-month period ending December 2008. For the DCF dividend yields for the group, I am using

the average of the six month and December 2008 dividend yields, which is 4.1%.

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

A. 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.[7]

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.

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

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[7] *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).

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

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

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

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

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

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

A. 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.

Q. 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?

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

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

A. Historic growth rates for the companies in the group, as published in the *Value Line Investment Survey*, are provided on page 3 of Exhibit JRW-10. Due to

the presence of outliers among the historic growth rate figures, both the mean and medians are used in the analysis.[8] The historical growth measures in EPS, DPS, and BVPS for the Gas Proxy Group, as measured by the means and medians, range from 1.5% to 7.4%, with an average of 4.2%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the companies in the proxy group are shown on page 4 of Exhibit JRW-10. As 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 3.3% to 5.3%, with an average of 4.3%.

Also provided on page 4 of Exhibit JRW-10 is prospective internal growth for the proxy group as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, internal growth is significant in a primary driver of long-run earnings growth. For the Gas Proxy Group, the average prospective internal growth rate is 5.5%.

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

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

A. Zacks, and Bloomberg collect, summarize, and publish Wall Street analysts' five-year EPS growth rate forecasts for the companies in the proxy group. These forecasts are provided for the companies in the proxy group on page 5 of Exhibit JRW-10. The median of analysts' projected EPS growth rates for the Gas Proxy Group is 5.31%.[9]

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

A. Page 6 of Exhibit JRW-10 shows the summary DCF growth rate indicators for the proxy group. The average of the growth rate indicators for the Gas Proxy Group is 4.83%. Giving greater weight to prospective retention growth and the projected growth rate indicators, an expected DCF growth rate in the 5.0%-5.5% range appears reasonable for the group. I will use the midpoint of this range, 5.25%, as the expected growth rate for the Gas Proxy Group.

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

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

[9] 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.

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

$$\text{DCF Equity Cost Rate (k)} = 4.1\% + 5.25\% = 9.5\%$$

C. Capital Asset Pricing Model Results

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

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

$$k = R_f + RP$$

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

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

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

Where:

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

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

Q. PLEASE DISCUSS EXHIBIT JRW-11.

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

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A. The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds, in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year maturities. However, when the Treasury's issuance of 30-year bonds was interrupted for a period of time in recent years, the yield on 10-year U.S. Treasury bonds replaced the yield on 30-year U.S. Treasury bonds as the benchmark long-term Treasury rate. The 10-year U.S. Treasury yields over the past five years are shown on page 2 of Exhibit JRW-11. These rates hit a 60-year low in the summer of 2003 at 3.33%. They increased with the rebounding economy and fluctuated in the 4.0-4.50 percent range in recent years until advancing to 5.0% in early 2006 in response to a strong economy and increases in energy, commodity, and consumer prices. In late 2006, long-term interest rates retreated to the 4.5 percent area as commodity and energy prices declined and inflationary pressures subsided. These rates rebounded to the 5.0% level in the first half of 2007. However, ten-year Treasury yields have again fall below 4.0 percent due to the housing and sub-prime mortgage crises and its affect on the economy and financial markets.

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

A. 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 2007 and have remained at these lower levels. In 2008 Treasury yields have been pushed even lower as a result of the mortgage and sub-prime market credit crisis, the turmoil in the financial sector, the uncertainty associated with the length of the economic recession, and the government bailout of financial institutions. In total, these developments have led to a flight to quality in the bond market which has driven Treasury yields to historic low levels. As of December 17, 2008, as shown on page 2 of Exhibit JRW-11, the rates on 10- and 30- U.S. Treasury Bonds were 2.09% and 2.62%, respectively. However, these yields have been highly volatile over the past three months. Given this recent range and volatility, along with the prospect of higher rates, I believe that a long-term Treasury rate in the 3.0%-4.0% is reasonable for the near future. I will use the midpoint of this range, 3.5%, as the risk-free rate, or R_f, in my CAPM.

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

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

than the market and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a stock's return on the market return.

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

Numerous online investment information services, such as Yahoo! and Reuters, provide estimates of stock betas. 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 group, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-11, the average beta for the companies in Gas Proxy Group is 0.82.

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

A. 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.

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

A. Page 4 of Exhibit JRW-11 highlights the primary approaches to, and issues in, estimating the expected equity risk premium. The traditional way to measure the equity risk premium was to use the difference between historical average stock and bond returns. In this case, historical stock and bond returns, also called ex post returns, were used as the measures of the market's expected return (known as the ex ante or forward-looking expected return). This type of historical evaluation of stock and bond returns is often called the "Ibbotson approach" after Professor Roger Ibbotson who popularized this method of using historical financial market returns as measures of expected returns. Most historical assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the rate on long-term U.S. Treasury bonds. However, this can be a problem because: (1) ex post returns are not the same as ex ante expectations, (2) market risk premiums can change over time; increasing when investors become more risk-averse and decreasing when investors become less risk-averse, and (3) market conditions can change such that ex post historical returns are poor estimates of ex ante expectations.

The use of historical returns as market expectations has been criticized in numerous academic studies.[10] The general theme of these studies is that the large equity risk premium discovered in historical stock and bond returns cannot be justified by the fundamental data. These studies, which fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using market data to arrive at an expected equity risk premium. These studies have also been called "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first questioned the magnitude of historical equity risk premiums relative to fundamentals.[11]

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

A. 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.

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

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

Fama and French (2002), two of the most preeminent scholars in finance, use dividend and earnings growth models to estimate expected stock returns and ex ante expected equity risk premiums.[12] 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.

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

The study by Claus and Thomas of Columbia University provides direct support for the findings of Fama and French.[13] These authors compute ex ante expected equity risk premiums over the 1985-1998 period by: (1) computing the discount rate that equates market values with the present value of expected future cash flows and (2) then subtracting the risk-free interest rate. The expected cash flows are developed using analysts' earnings forecasts. The authors conclude that over this period, the ex ante expected equity risk premium is in the range of 3.0%. Claus and Thomas note that, over this period, ex post historical stock returns overstate the ex ante expected equity risk premium because, as the expected equity risk premium has declined, stock prices have risen. In other words, from a valuation perspective, the present value of expected future returns 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.

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

A. Derrig and Orr (2003), Fernandez (2007), and Song (2007) have completed the most comprehensive reviews to date of the research on the equity risk

[13] 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).

premium.[14] Derrig and Orr's study evaluated the various approaches to estimating equity risk premiums as well as the issues with the alternative approaches and summarized the findings of the published research on the equity risk premium. Fernandez examined four alternative measures of the equity risk premium – historical, expected, required, and implied. He also reviewed the major studies of the equity risk premium and presented the summary equity risk premium results. Song provides an annotated bibliography and highlights the alternative approaches to estimating the equity risk summary.

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

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

[14] 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).

A. Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[15] They use 75 years of data and relate the compounded historical returns to the different fundamental variables employed by different researchers in building ex ante expected equity risk premiums. Among the variables included were inflation, real EPS and DPS growth, ROE and book value growth, and price-earnings ("P/E") ratios. By relating the fundamental factors to the ex post historical returns, the methodology bridges the gap between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach using the geometric returns and five fundamental variables – inflation ("CPI"), dividend yield ("D/P"), real earnings growth ("RG"), repricing gains ("PEGAIN") and return interaction/reinvestment ("INT").[16] This is shown on page 6 of Exhibit JRW-11. The first column breaks the 1926-2000 geometric mean stock return of 10.7% into the different return 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%).

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

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

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

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

CPI – To assess expected inflation, I have employed expectations of the short-term and long-term inflation rate. Page 7 of Exhibit JRW-11 shows the expected annual inflation rate according to consumers, as measured by the CPI, over the coming year. This survey is published monthly by the University of Michigan Survey Research Center. In the most recent report, the expected one-year inflation rate was 3.9%.

Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*.[17] This survey of professional economists has been published for almost 50 years. While this survey is published quarterly, only the first quarter survey includes long-term forecasts of gross domestic product ("GDP") growth, inflation, and market returns. In the first quarter 2008 survey, published on February 12, 2008, the median long-term (10-year) expected inflation rate as measured by the CPI was 2.5% (see page 8 of Exhibit JRW-11).

[17]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.

Given these results, I will use the average of the surveys of the University of Michigan and Federal Reserve Bank of Philadelphia (3.9% and 2.5%), or 3.2%.

D/P – As shown on page 9 of Exhibit JRW-11, the dividend yield on the S&P 500 has decreased gradually over the past decade. Today, it is 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 2.85% which I use in the ex ante risk premium analysis.

RG – To measure expected real growth in earnings, I use: (1) the historical real earnings growth rate for the S&P 500 and (2) expected real GDP growth. The S&P 500 was created in 1960. It includes 500 companies which come from ten different sectors of the economy. Over the 1960-2007 period, nominal growth in EPS for the S&P 500 was 7.36%. On page 10 of Exhibit JRW-11, real EPS growth is computed using the CPI as a measure of inflation. As indicated by Ibbotson and Chen, real earnings growth over the 1926-2000 period was 1.8%. The real growth figure over 1960-2007 period for the S&P 500 is 3.0 %.

The second input for expected real earnings growth is expected real GDP growth. The rationale is that over the long-term, corporate profits have averaged a relatively consistent 5.50% of U.S. GDP.[18] Real GDP growth, according to McKinsey, has averaged 3.5% over the past 80 years. Expected

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

GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.75% (see page 8 of Exhibit JRW-11).

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

PEGAIN – PEGAIN is the repricing gain associated with an increase in the P/E ratio. It accounted for 1.3% of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock market return, one issue is whether investors expect P/E ratios to increase from their current levels. The P/E ratios for the S&P 500 over the past 25 years are shown on page 9 of Exhibit JRW-11. The run-up and eventual peak in P/Es is most notable in the chart. The relatively low P/E ratios (in the range of 10) over two decades ago are also quite notable. As of October 31, 2008, the P/E for the S&P 500 was 18.86. [19]

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

[19] Source: www.standardandpoors.com.

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.

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

A. My expected market return is represented by the last column on the right in the graph entitled "Decomposing Equity Market Returns: The Building Blocks Methodology" set forth on page 6 of Exhibit JRW-11. As shown, my expected market return of 8.90% is composed of 3.20% expected inflation, 2.85% dividend yield, and 2.85% real earnings growth rate.

Q. GIVEN THAT THE HISTORICAL COMPOUNDED ANNUAL MARKET RETURN IS IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET RETURN OF 8.90% IS REASONABLE?

A. 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 2.85%. Due to these reasons, lower market returns are expected for the future.

Q. IS YOUR EXPECTED MARKET RETURN OF 8.90% CONSISTENT WITH THE FORECASTS OF MARKET PROFESSIONALS?

A. 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).

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

A. 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 third quarter 2008 survey, the mean expected return on the S&P 500 over the next ten years was 7.79%.[20]

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

A. As shown on page 2 of Exhibit JRW-11, the current 30-year U.S. Treasury yield is 2.62%. My ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

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

Ex Ante Equity Risk Premium = 8.90% - 2.62% = 6.28%

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

A. As discussed above, page 5 of Exhibit JRW-11 provides a summary of the results of the equity risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) ex ante equity risk premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters, and academics, and (4) the Building Block approaches to the equity risk premium. There are results reported for over thirty studies, and the average equity risk premium is 4.78%, which I will use as the equity risk premium in my CAPM study.

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

A. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall Street's leading investment strategists.[21] 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

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

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 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.[22]

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

A. Yes. In the previously referenced third quarter 2008 CFO survey conducted by *CFO Magazine* and Duke University, the expected 10-year equity risk premium was 3.99%.

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

[22] 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.

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

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

A. 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.[23]

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

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

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

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$
$$K = 3.5\% + 0.82 * 4.78\%$$
$$K = 7.4\%$$

VI. EQUITY COST RATE SUMMARY

Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A. The results for my DCF and CAPM analyses for the proxy group of gas distribution companies indicate equity cost rates of 9.5% and 7.4%, respectively.

Q. GIVEN THESE RESULTS, WHAT IS YOUR ESTIMATED EQUITY COST RATE FOR THE GROUP?

A. Given these results, I conclude that the appropriate equity cost rate for the Gas Proxy Group is in the 7.4%-9.5% range. However, due to the current volatile market conditions which were discussed above, I am using the upper end of the range as the equity cost rate. Therefore, I am recommending an equity cost rate of 9.25% for Peoples. This seems especially fair to the Company given the Peoples' higher common equity ratio and therefore lower degree of lower financial risk. In addition, due to the uncertain market conditions, I reserve the right to update my study prior to hearings.

Q. ISN'T YOUR EQUITY COST RATE RECOMMENDATION LOW BY HISTORICAL STANDARDS?

A. Yes, it is and appropriately so. My rate of return is low by historical standards for two reasons. First, as discussed above, current capital costs are low by historical standards, with interest rates at a cyclical low not seen since the 1960s. And second, as previously discussed, the equity or market risk premium has declined.

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

A. 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 Gas Proxy Group.

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

A. Exhibit JRW-3 provides financial performance and market valuation statistics for companies in the proxy group. The mean current return on equity and market-to-book ratio for the group are 10.7% and 1.66, respectively. These results indicate that, on average, these companies are earning returns on equity above their equity cost rates. As such, this observation provides evidence that my recommended equity cost rate is reasonable and fully consistent with the

financial performance and market valuation of the proxy group of gas distribution companies.

VII. CRITIQUE OF PEOPLES' RATE OF RETURN TESTIMONY

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

A. The Company's proposed rate of return is inflated due to overstated debt and equity cost rates. The debt cost rates were previously discussed. I will now discuss Dr. Murry's equity cost rate analysis.

Q. PLEASE REVIEW DR. MURRY'S EQUITY COST RATE APPROACHES.

A. Dr. Murry uses a proxy group of gas distribution companies as well as TECO Energy and employs CAPM and DCF equity cost rate approaches.

Q. PLEASE SUMMARIZE DR. MURRY'S EQUITY COST RATE RESULTS.

A. Dr. Murry's equity cost rate estimates for Peoples are summarized in Panel A of Exhibit JRW-12. Based on these figures, he concludes that the appropriate equity cost rate for the Company is 11.5%.

Q. PLEASE DISCUSS YOUR ISSUES WITH DR. MURRY'S RECOMMENDED EQUITY COST RATE.

A. Dr. Murry's proposed return on common equity is too high primarily due to: (1) an excessive adjustment to the dividend yield and an inflated growth rate in his DCF approach; (2) his use of the higher end of his DCF results to compensate for flotation costs, market pressure, and market value – book value adjustment; and (3) overstated equity risk premium estimates, as well as the inclusion of a size premium, in his CAPM approaches.

A. DCF Approach

Q. PLEASE SUMMARIZE DR. MURRY'S DCF ESTIMATES.

A. On pages 23-42 of his testimony and in Exhibits DAM-13 – DAM-19, Dr. Murry develops an equity cost rate by applying a DCF model to TECO Energy and his group of comparable companies. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. For TECO Energy and the comparable group, he performs two DCF analyses – a 52-week DCF using stock prices over the past year, and a Current DCF using stock prices over the past two weeks. For each of these DCFs, he computes equity cost rates using (1) projected DPS growth rates, (2) *Value Line* projected EPS over the 2002-04 to the 20011-13 time period, and (3) projected EPS growth rates estimates from *Value Line* (from 2006-07 to 20011-13) and from analysts as compiled by Yahoo!. Dr. Murry's DCF results are provided in Panel B of Exhibit JRW-12. Based on these figures,

Dr. Murry claims that the relevant DCF results for Peoples are in the range of 10.04% to 11.02%.

Q. PLEASE EXPRESS YOUR CONCERNS WITH DR. MURRY'S DCF STUDY.

A. I have several major concerns with Dr. Murry's DCF analyses. These are: (1) he has ignored results using projected DPS growth rates for both TECO Energy and the comparable gas company group; (2) he has totally ignored the DCF results for TECO Energy and relied on highly selected results of his comparable group of gas companies; (3) his selected DCF results rely on the upwardly biased EPS growth rates estimates from *Value Line* and from Wall Street analysts as compiled by Yahoo!; and (4) he has erroneously relied on the upper end of the DCF results to account for undocumented flotation costs and market pressure.

Q. PLEASE ADDRESS YOUR FIRST ISSUE.

A. Dr. Murry has ignored the DCF results for both TECO Energy and the comparable group using projected DCF growth rates. In the DCF model, the cash flows that investors receive are in the form of dividends. The average projected DPS growth for TECO Energy and the comparable gas group are in the 2.0% and 3.0% range, respectively. Ignoring the DCF results which use projected DPS growth rates leads to an upwardly biased estimate of a DCF equity cost rate.

Q. YOU CLAIM THAT DR. MURRY HAS ALSO IGNORED THE VAST MAJORITY OF HIS DCF RESULTS. PLEASE EXPLAIN.

A. Dr. Murry's summary results are provided in Schedule DAM-23. On page 48 of his testimony, Dr. Murry claims that the relevant DCF results are from 10.04% to 11.02%. However, these are the high-end of the range of DCF figures for the comparison group using: (1) 2000-02 to 2009-11 EPS growth rates; and (2) analysts' projected EPS growth rates from *Value Line* and Wall Street analysts as compiled by Yahoo!. This relevant range simply represents the high end of the range using these two growth rate measures. As such, he has totally ignored the DCF results for TECO Energy as well as the majority of the DCF results for his comparable group of gas distribution companies. By ignoring these results, he is recommending a DCF equity cost rate using the results for the company which is 200-300 basis points higher than that of his comparable gas company group.

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

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

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

A. Analysts' growth rate forecasts are collected and published by Bloomberg, Zacks, First Call, I/B/E/S, and Reuters. These services retrieve and compile EPS forecasts from Wall Street analysts. These analysts come from both the sell side (Merrill Lynch, Paine Webber) and the buy side (Prudential Insurance, Fidelity).

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

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 observation period are 143.06% and 75.08%, respectively. The forecast errors are negative for only eleven of the eighty quarterly time periods: five consecutive quarters starting at the end of 1995 and six consecutive quarters starting in 2006. As shown in JRW-13, 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. Thus, 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 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 are shown in

Panel B of Exhibit JRW-13. In this graph no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, 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 EPS growth has since declined to the 15.0% range.

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

A. Analysts' EPS growth rate forecasts have subsided somewhat since the stock market peak of 2000. In addition, the apparent conflict of interest within investment firms with investment banking and analysts' operations was addressed in the Global Analysts Research Settlements ("GARS"). GARS, as agreed upon on April 23, 2003 between the SEC, NASD, NYSE and ten of the largest U.S. investment firms, includes a number of regulations that were introduced to prevent investment bankers from pressuring analysts to provide favorable projections. Nonetheless, despite the new regulations, analysts' EPS growth rate forecasts have not significantly changed and continue to be overly-optimistic. Analysts' long-term EPS growth rate forecasts before and after the GARS, are about two times the level of historic GDP growth.

Furthermore, historic growth in GDP and corporate earnings has been in the 7% range.

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

> Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. "You would have thought that, given what happened in the last three years, people would have given up the ghost. But in large measure they have not."
>
> These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their firms' investment-banking relationships, a lot of things haven't changed: Research remains rosy and many believe it always will.[24]

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

A. Yes. Page 2 of Exhibit JRW-13 provides a recent article published in the *Wall Street Journal* that discusses the upward bias in analysts' EPS growth rate forecasts.

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

[24] 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.

A. 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 Panel C of Exhibit JRW-13. The projected EPS growth rates have declined from about six percent in the 1990s to about five percent in the 2000s. As shown, the achieved EPS growth rates have been volatile. Overall, the upward bias in EPS growth rate projections is not as pronounced for 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.

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

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

percent of the companies covered by *Value Line*. Given the ups and downs of corporate earnings, this is unreasonable.

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

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

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF DR. MURRY'S DCF GROWTH RATE.

A. Dr. Murry's DCF equity cost rate is overstated because he has: (1) selectively picked the high end of the range of his DCF equity cost rate estimates; and (2) relied exclusively on the upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*.

Q. ON PAGES 28-30 OF HIS TESTIMONY, DR. MURRY HAS ARGUED THAT HE HAS FOCUSED ON THE HIGHER DCF RESULTS AS AN

ALTERNATIVE TO MAKING AN ADJUSTMENT FOR FLOTATION COSTS OR MARKET PRESSURE. PLEASE RESPOND.

A. Dr. Murry's argument for using the higher end DCF results to account for flotation costs or market pressure is in error. There is no need for such an adjustment. Usually it is argued that a flotation cost adjustment is necessary to prevent the dilution of the existing shareholders. Such an adjustment is commonly justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for gas distribution 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 lower than the coupon rate of the debt. The amount by which market values of gas distribution companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

(2) It is commonly argued that a flotation cost adjustment is needed to prevent dilution of existing stockholders' investment. However, the reduction of the book value of stockholder investment associated with flotation costs can occur only when a company's stock is selling at a market price at/or below its book value. As noted above, gas distribution companies are selling at market prices well in excess of book value. Hence, when new shares are sold, existing shareholders realize an increase in the book value per share of their investment, not a decrease;

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

(4) Flotation costs, in the form of the underwriting spread, are a form of a

transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas Dr. Murry believes that the Company should be compensated for these transactions costs by using the high-end DCF results, neither he or I have accounted for other market transaction costs in determining a cost of equity for the Company. Most notably, brokerage fees that investors pay when they buy shares in the open market are another market transaction cost. Brokerage fees increase the effective stock price paid by investors to buy shares. If Dr. Murry and I had included these brokerage fees or transaction costs in our DCF analyses, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. To be fair then, if Dr. Murry is to make an upward adjustment for transaction costs in the form of using the high-end DCF results, he also should have made a downward adjustment for transaction costs in the form of brokerage fees.

B. CAPM Analysis

Q. PLEASE DISCUSS DR. MURRY'S CAPM.

A. On pages 33-39, in Schedules DAM-24 and DAM-25, Dr. Murry applies the CAPM to TECO Energy and the comparison group of gas companies. The first CAPM, which he calls the size-adjusted CAPM, is a traditional CAPM with an incremental 0.92%-1.65% adjustment to account for the relative size of TECO Energy and the comparable gas companies. The second CAPM,

which Dr. Murry calls a historical CAPM, is based strictly on historical stock and bond returns. Dr. Murry's historical CAPM is very untraditional in three ways: (1) the market total return is the average of the historical returns for large and small stocks as reported by Ibbotson Associates, (2) the historic bond return of 6.20% is for long-term corporate bonds, and (3) the risk-free rate Dr. Murry uses is the historic Aaa corporate bond return. The results of Dr. Murry's CAPM analyses are summarized in Panel C of Exhibit JRW-12.

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF DR. MURRY'S CAPM ANALYSES.

A. There are two primary flaws with Dr. Murry's CAPM analyses: (1) his explicit size adjustment of 0.92% for TECO Energy and 1.65% for the comparison gas group in his size-adjusted CAPM and an implicit size premium in his historical CAPM; and (2) most significantly, his equity risk premium of 7.10% in his size-adjusted CAPM and his risk premium of 8.50% in his historical CAPM.

Q. PLEASE DISCUSS DR. MURRY'S EXPLICIT AND IMPLICIT SIZE ADJUSTMENTS.

A. As noted above, Dr. Murry uses explicit size adjustment of 0.92% for TECO Energy and 1.65% for the comparison gas group in his size-adjusted CAPM and uses an implicit size premium in his historical CAPM. The implicit size premium in his historical CAPM results from the fact that his market total

return of 14.70% is the average of the arithmetic mean stock returns for large stocks and for small stocks from Ibbotson Associates. Dr. Murry supports the need for a size premium by citing the work of Ibbotson Associates.

There are several flaws in this analysis. First, as discussed later in my testimony, there are a number of errors in using historical market returns to compute risk premiums. Second, the Ibbotson study used for the explicit size premium is based on the stock returns for companies in the 10^{th} decile. However, a review of the Ibbotson document indicates that these companies have betas that are much larger than the betas of gas distribution companies. Hence, these size premiums are not associated with the gas distribution industry.

Finally, and most importantly, any equity cost rate adjustment based on the relative size of a public utility is inappropriate. 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.[25] 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 on-going 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,

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

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 disclose, utilities are much different than industrials which could account for the lack of a size premium.

Q. PLEASE REVIEW THE ERRORS IN DR. MURRY'S EQUITY OR RISK PREMIUM IN HIS TWO CAPM APPROACHES.

A. The primary problem with Dr. Murry's two CAPM analyses is the size of the market or equity risk premium. Dr. Murry uses a risk premium of 7.10% in his size-adjusted CAPM. This is the arithmetic average risk premium of the 1926-2007 results from the Ibbotson study. He uses a risk premium of 8.50% in his historical CAPM which is the difference between his historic market return of 14.70% (the average of the arithmetic mean stock returns for large stocks of 12.3% and for small stocks of 17.1%) and 6.20% which is the historic long-term corporate bond return. Both of these risk premiums are based solely on the difference in the arithmetic mean stock and bond returns over the 1926-2007 period.

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

A. 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.

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

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

(A) Biased historical bond returns;

(B) The arithmetic versus the geometric mean return;

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

(D) Biased historical stock returns and transactions costs;

(E) Company survivorship bias;

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

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

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

These issues will be addressed in order.

Biased Historical Bond Returns

Q. HOW ARE HISTORICAL BOND RETURNS BIASED?

A. 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.

The Arithmetic versus the Geometric Mean Return

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

A. 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."[26] Since Dr. Murry'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.

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

A. 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

[26] 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.

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.[27] Therefore, Dr. Murry's arithmetic mean return measures are upwardly biased and should be disregarded.

The Large Error in Measuring Equity Risk Premiums with Historic Data

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

A. 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.

Biased Historic Stock Returns and Transactions Costs

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

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

A. 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.[28]

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

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

realized equity returns were probably 100-200 basis points below those calculated from historic data.[29]

Company Survivorship Bias

Q. HOW DOES COMPANY SURVIVORSHIP BIAS AFFECT DR. MURRY'S HISTORIC EQUITY RISK PREMIUM?

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

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

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

A. Dr. Murry'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

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

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.

Market Conditions Today are Significantly Different than in the Past

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

A. 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.

Changes in Risk and Return in the Markets

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

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

Page 1 of Exhibit JRW-15 provides the yields on long-term U.S. Treasury bonds from 1926 to 2007. One very obvious observation from this graph is that interest rates 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-15. The annual market risk premium is defined as the return on common stock minus the return on long-term U.S. Treasury Bonds. There is considerable variability in this series and a clear decline in recent decades. The high was 54% in 1933, and the low was -38% in 1931. Evidence of a change in the relative riskiness of bonds and stocks is provided on page 3 of

Exhibit JRW-15, which plots the standard deviation of monthly stock and bond returns since 1930. The plot shows that, whereas stock returns were much more volatile than bond returns from the 1930s to the 1970s, bond returns became more variable than stock returns during the 1980s. In recent years stocks and bonds have become much more similar in terms of volatility, but stocks are still a little more volatile. The decrease in the volatility of stocks relative to bonds over time has been attributed to several stock related factors: (1) the impact of technology on productivity and the new economy; (2) the role of information (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-15, which plots real interest rates (the nominal interest rate minus inflation) from 1926 to 2007. Real rates have been well above historic norms during the past 10-15 years. These high real interest rates reflect the fact that investors view bonds as riskier investments.

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

such, using a historic equity risk premium analysis is simply outdated and not reflective of current investor expectations and investment fundamentals.

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

A. 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.[30] 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.

Q. PLEASE PROVIDE A SUMMARY ASSESSMENT OF DR. MURRY'S HISTORICAL EQUITY RISK PREMIUMS.

A. Dr. Murry's equity risk premiums of 7.1% and 8.5% are derived from a historical stock and bond returns is not reflective of market expectations. As noted above, equity risk premiums estimated from historical returns are subject to a myriad of empirical problems that prevent them from being measures of market expectations. Perhaps reflective of these empirical issues, Dr. Murry's equity risk premiums are well in excess of the equity risk premium estimates discovered in recent studies by leading finance scholars. They are also especially out of touch with the real world of finance. Investment

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

banks, consulting firms, and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions. On this issue, the opinions of CFOs are especially relevant. CFOs deal with capital markets on an ongoing basis since they must continually assess and evaluate capital costs for their companies. Furthermore, as is the case with any student of finance, they are well aware of the historical equity risk premium results as published by Morningstar/Ibbotson Associates. Exhibit JRW-16 shows the equity risk premium results from the Duke University – *CFO Magazine* survey on a quarterly basis from 2000 to 2008. The CFOs in the survey indicate that the appropriate equity risk premium at the present time is in the 4.0% range and certainly not in the 7.1%-8.5% range

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

APPENDIX 1

QUALIFICTIONS OF DR. J. RANDALL WOOLRIDGE

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).

Exhibit JRW-1

Peoples Gas System
Cost of Capital

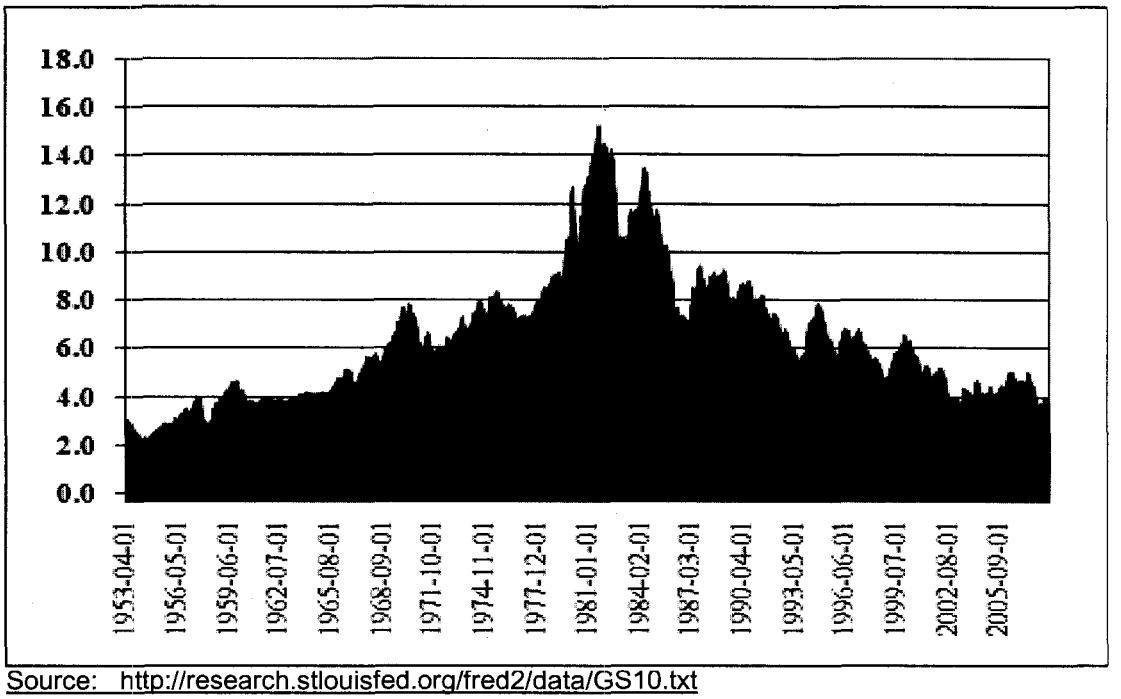
Weighted Average Cost of Capital - Regulatory Capital Structure

Capital Source	Capital	Capitalization Ratio	Cost Rate	Weighted Cost Rate
COMMON EQUITY	273,561,565	48.54%	9.25%	4.49%
LONG TERM DEBT	222,773,987	39.53%	7.20%	2.85%
SHORT TERM DEBT	3,456,397	0.61%	1.76%	0.01%
CUSTOMER DEPOSITS - RES	9,338,641	1.66%	6.00%	0.10%
CUSTOMER DEPOSITS - COMM	26,309,935	4.67%	7.00%	0.33%
INACTIVE DEPOSITS	480,368	0.09%	0.00%	0.00%
DEFERRED TAXES	27,670,682	4.91%	0.00%	0.00%
TAX CREDIT	7,862	0.00%	0.00%	0.00%
	563,599,437	100.00%		7.77%

Weighted Average Cost of Capital - Conventional Capital Structure

Capital Source		Capital	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Common Equity		273,561,565	54.74%	9.25%	5.06%
Long-Term Debt		222,773,987	44.57%	7.20%	3.21%
Short-Term Debt		3,456,397	0.69%	1.76%	0.01%
Total	$	499,791,950	100.00%		8.28%

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



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

Exhibit JRW-3
Peoples Gas System
Summary Financial Statistics for Gas Proxy Group

Gas Proxy Group

Company	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	Moody's Bond Rating	S&P Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
AGL Resources Inc. (NYSE-ATG)	2,510.0	68%	3,663.0	A3	A-	3.0	GA,VA	44	8.3%	1.27
Atmos Energy Corporation (NYSE-ATO)	6,782.7	52%	4,012.9	Baa3	BBB	2.8	LA,KY,TX, CO,KS	49	8.4%	0.93
Laclede Group, Inc. (NYSE-LG)	2,117.8	53%	813.1	A3	A	3.0	MO	57	13.2%	2.14
NICOR Inc. (NYSE-GAS)	3,580.2	84%	2,780.2	A1	AA	5.9	IL	66	15.7%	1.94
Northwest Natural Gas Co. (NYSE-NWN)	1,034.8	98%	1,517.1	A2	AA-	4.0	OR,WA	52	11.4%	1.93
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	2,055.4	82%	2,231.1	A3	A	4.0	NC,SC,TN	48	12.6%	2.47
South Jersey Industries, Inc. (NYSE-SJI)	900.2	65%	963.3	Baa1	A	3.3	NJ	52	7.6%	1.94
Southwest Gas Corporation (NYSE-SWX)	2,192.7	84%	2,912.1	Baa3	BBB-	2.3	AZ,NV,CA	46	8.1%	1.05
WGL Holdings, Inc. (NYSE-WGL)	2,562.0	59%	2,180.6	A2	AA-	5.7	DC,MD,VA	60	10.9%	1.24
Mean	2,637.3	72%	2,341.5	Baa1		3.8		53	10.7%	1.66

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

Exhibit JRW-4
Peoples Gas System
Capital Structure Ratios

Panel A - Peoples' Recommended Capitalization Ratios - Investor Provided Capital

Capital	Capitalization Amount	Capitalization Ratios
Short-Term Debt	3,456,397	0.69%
Long-Term Debt	222,773,988	44.57%
Common Equity	273,561,566	54.74%
Total Capital	499,791,951	100.00%

Source: Testimony of Dr. Murry

Panel B - Peoples's Average Capitalization Ratios - 2005-2007

	2005	2006	2007	Average
Short-Term Debt	37.78%	36.57%	37.69%	37.35%
Long-Term Debt	2.81%	4.20%	4.74%	3.92%
Common Equity*	59.42%	59.22%	57.57%	58.74%
Total	100.00%	100.00%	100.00%	100.00%

Source: Page 2 of Exhibit JRW-4

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

	2008
Average Common Equity Ratio	49.9

Source: Page 3 of Exhibit JRW-4

Panel D - Peoples Capital Structure

Source	2007	2008	2009	Average
COMMON EQUITY	49.66%	48.33%	48.54%	48.84%
LONG TERM DEBT	34.69%	38.53%	39.53%	37.58%
SHORT TERM DEBT	3.85%	1.84%	0.61%	2.10%
CUST. DEPOSITS RESID.	1.87%	1.72%	1.66%	1.75%
CUST. DEPOSITS COMM'L.	4.86%	4.74%	4.67%	4.75%
INACTIVE DEPOSITS	0.06%	0.08%	0.09%	0.07%
DEFERRED INCOME TAXES	4.99%	4.76%	4.91%	4.89%
TAX CREDITS	0.02%	0.01%	0.00%	0.01%
TOTAL	100.00%	100.00%	100.00%	100.00%

Capital Structure Investor Sources Only:

Source	2007	2008	2009	Average
COMMON EQUITY	56.30%	54.49%	54.74%	55.18%
LONG TERM DEBT	39.33%	43.44%	44.57%	42.45%
SHORT TERM DEBT	4.36%	2.07%	0.69%	2.38%
TOTAL	100.00%	100.00%	100.00%	100.00%

Source: MFR D-1a

Panel E - OPC Recommended Capital Structure Ratios

Source	Capitalization Amount	Capitalization Ratios
COMMON EQUITY	273,561,565	48.54%
LONG TERM DEBT	222,773,987	39.53%
SHORT TERM DEBT	3,456,397	0.61%
CUSTOMER DEPOSITS - RES	9,338,641	1.66%
CUSTOMER DEPOSITS - COMM	26,309,935	4.67%
INACTIVE DEPOSITS	480,368	0.09%
DEFERRED TAXES	27,670,682	4.91%
TAX CREDIT	7,862	0.00%
TOTAL	563,599,437	100.00%

Capital Structure Investor Sources Only:

Long Term Debt	54.74%
Short Term Debt	44.57%
Common Equity	0.69%
Total	100.00%

Peoples Gas System
Thirteen Month Jurisdictional Capital Structure

	2005				2005				
	Mar	**June**	**Sept**	**Dec**	**Mar**	**June**	**Sept**	**Dec**	**Average**
Long-term Debt	$ 167,938	$ 167,304	$ 165,434	$ 164,142	38.18%	38.08%	37.64%	37.20%	37.78%
Short-term Debt	$ 10,154	$ 10,241	$ 13,189	$ 15,828	2.31%	2.33%	3.00%	3.59%	2.81%
Common Equity	$ 261,742	$ 261,784	$ 260,923	$ 261,242	59.51%	59.59%	59.36%	59.21%	59.42%
Total	**$ 439,834**	**$ 439,329**	**$ 439,546**	**$ 441,212**	100.00%	100.00%	100.00%	100.00%	100.00%

	2006				2006				
	Mar	**June**	**Sept**	**Dec**	**Mar**	**June**	**Sept**	**Dec**	**Average**
Long-term Debt	$ 162,738	$ 161,613	$ 160,029	$ 158,751	36.96%	36.70%	36.38%	36.25%	36.57%
Short-term Debt	$ 16,099	$ 18,244	$ 19,848	$ 19,680	3.66%	4.14%	4.51%	4.49%	4.20%
Common Equity	$ 261,462	$ 260,461	$ 259,988	$ 259,492	59.38%	59.15%	59.11%	59.26%	59.22%
Total	$ 440,299	$ 440,318	$ 439,865	$ 437,923	100.00%	100.00%	100.00%	100.00%	100.00%

	2007				2007				
	Mar	**June**	**Sept**	**Dec**	**Mar**	**June**	**Sept**	**Dec**	**Average**
Long-term Debt	157272	$ 163,853	$ 172,987	$ 177,963	35.87%	36.95%	38.60%	39.33%	37.69%
Short-term Debt	22767	$ 23,774	$ 18,058	$ 19,736	5.19%	5.36%	4.03%	4.36%	4.74%
Common Equity	258382	$ 255,776	$ 257,072	$ 254,743	58.93%	57.68%	57.37%	56.30%	57.57%
Total	438421	443403	448117	452442	100.00%	100.00%	100.00%	100.00%	100.00%

Source: Tampa response to OPC POD 3-90.

Exhibit JRW-3
Peoples Gas System
Capital Structure Ratios

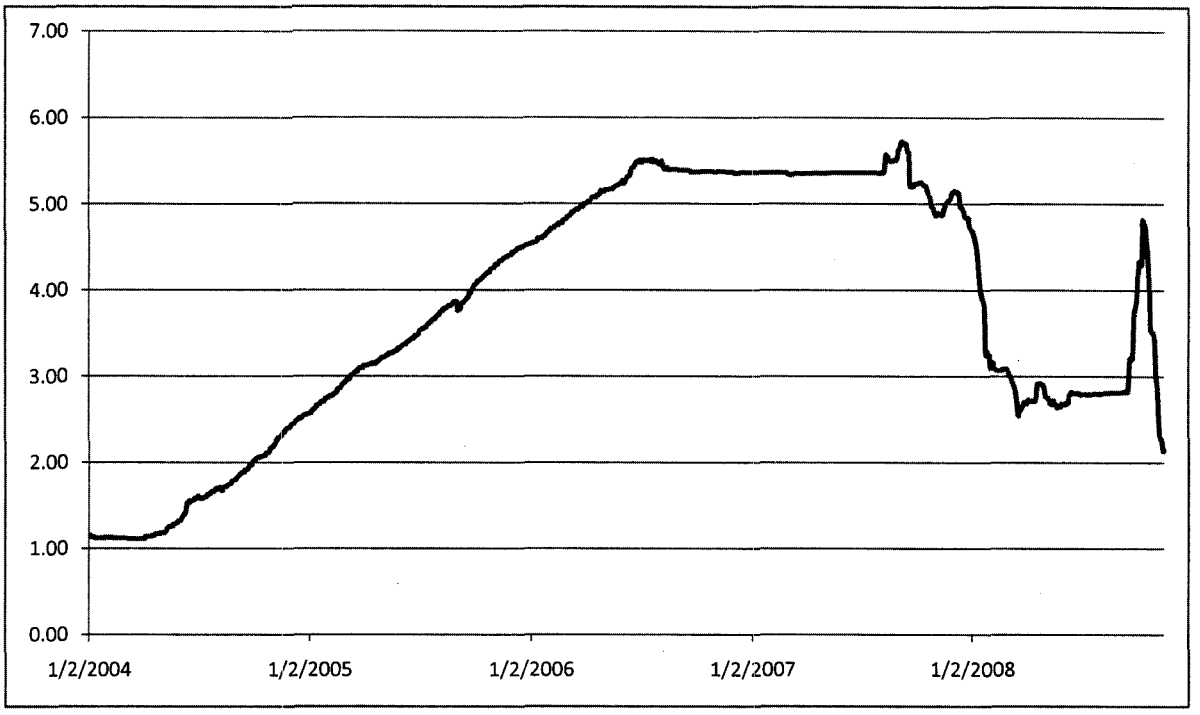
Gas Proxy Group

Company	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Mean
AGL Resources Inc. (NYSE-ATG)	43.0	43.0	42.0	42.0	42.0	47.0	47.0	47.0	44.0	44.0	44.0	**44.1**
Atmos Energy Corporation (NYSE-ATO)	46.0	46.0	47.0	47.0	47.0	50.0	50.0	50.0	49.0	49.0	49.0	**48.2**
Laclede Group, Inc. (NYSE-LG)	41.0	41.0	40.0	40.0	40.0	40.0	48.0	48.0	57.0	57.0	57.0	**46.3**
NICOR Inc. (NYSE-GAS)	58.0	58.0	58.0	52.0	52.0	65.0	65.0	65.0	65.0	66.0	66.0	**60.9**
Northwest Natural Gas Co. (NYSE-NWN)	48.0	48.0	48.0	47.0	47.0	52.0	52.0	52.0	52.0	52.0	52.0	**50.0**
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	48.0	46.0	46.0	45.0	45.0	45.0	51.0	51.0	51.0	48.0	48.0	**47.6**
South Jersey Industries, Inc. (NYSE-SJI)	48.0	48.0	48.0	50.0	50.0	56.0	56.0	56.0	56.0	52.0	52.0	**52.0**
Southwest Gas Corporation (NYSE-SWX)	43.0	43.0	43.0	43.0	43.0	46.0	46.0	46.0	46.0	46.0	46.0	**44.6**
WGL Holdings, Inc. (NYSE-WGL)	54.0	54.0	51.0	51.0	51.0	58.0	58.0	58.0	58.0	60.0	60.0	**55.7**
Mean	**47.7**	**47.4**	**47.0**	**46.3**	**46.3**	**51.0**	**52.6**	**52.6**	**53.1**	**52.7**	**52.7**	**49.9**

Data Source: AUS *Utility Reports.*

Tampa Electric Company
Short-Term Debt Cost Rate

Three-Month LIBOR Rates



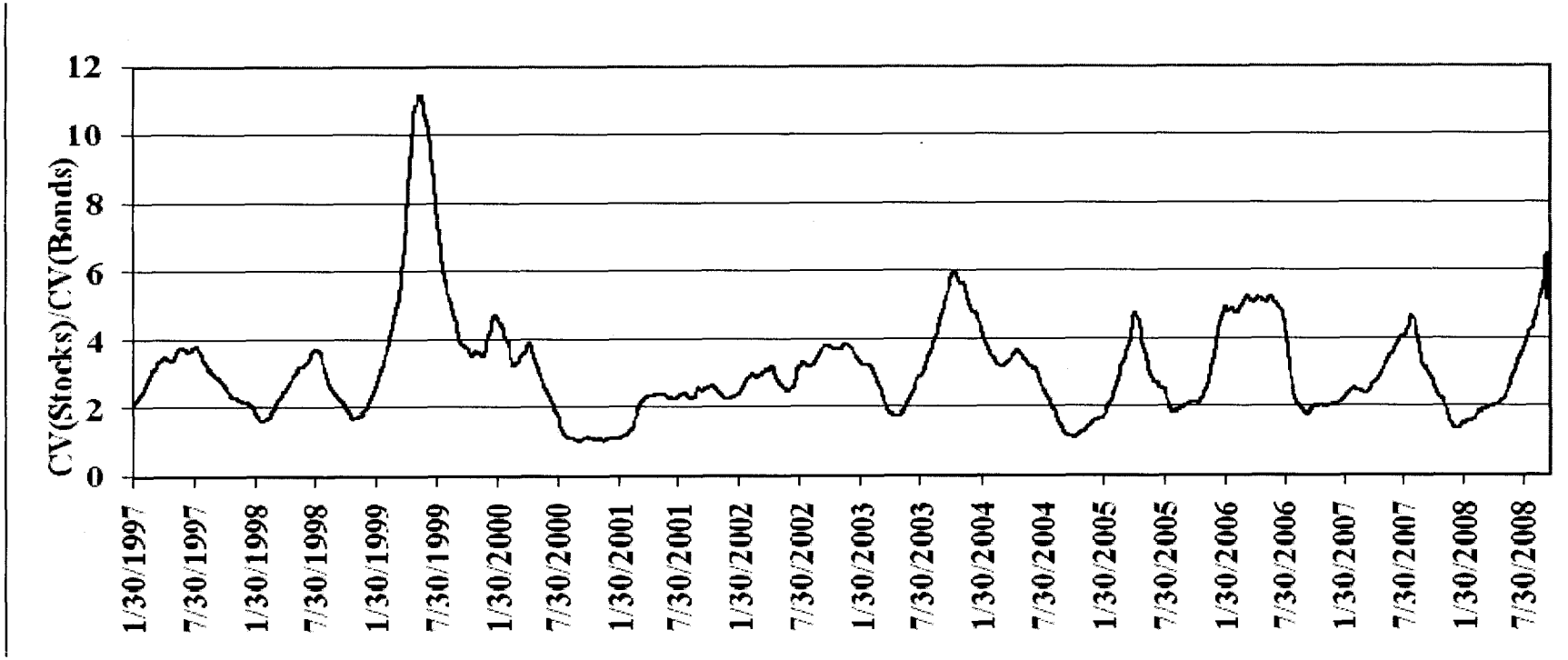
Current Three-Month LIBOR Rate

Key Rates	CURRENT
FEDERAL RESERVE TARGET RATE	.25
PRIME RATE	3.25
1-MONTH LIBOR	.58
3-MONTH LIBOR	1.58
5-YEAR AAA BANKING & FINANCE	5.41
10-YEAR AAA BANKING & FINANCE	6.17

Source: Bloomberg

Exhibit JRW-5

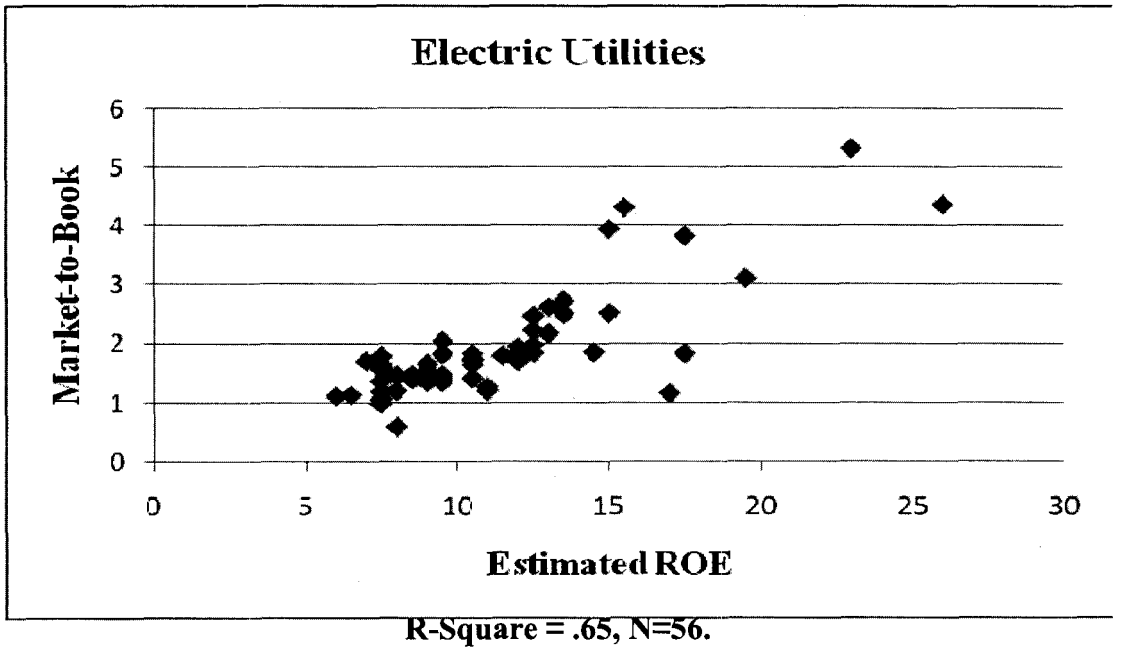
Coefficient of Variation
S&P 500 Price CV/Bear Stearns Bond Price Index CV



Data Source: Bloomberg

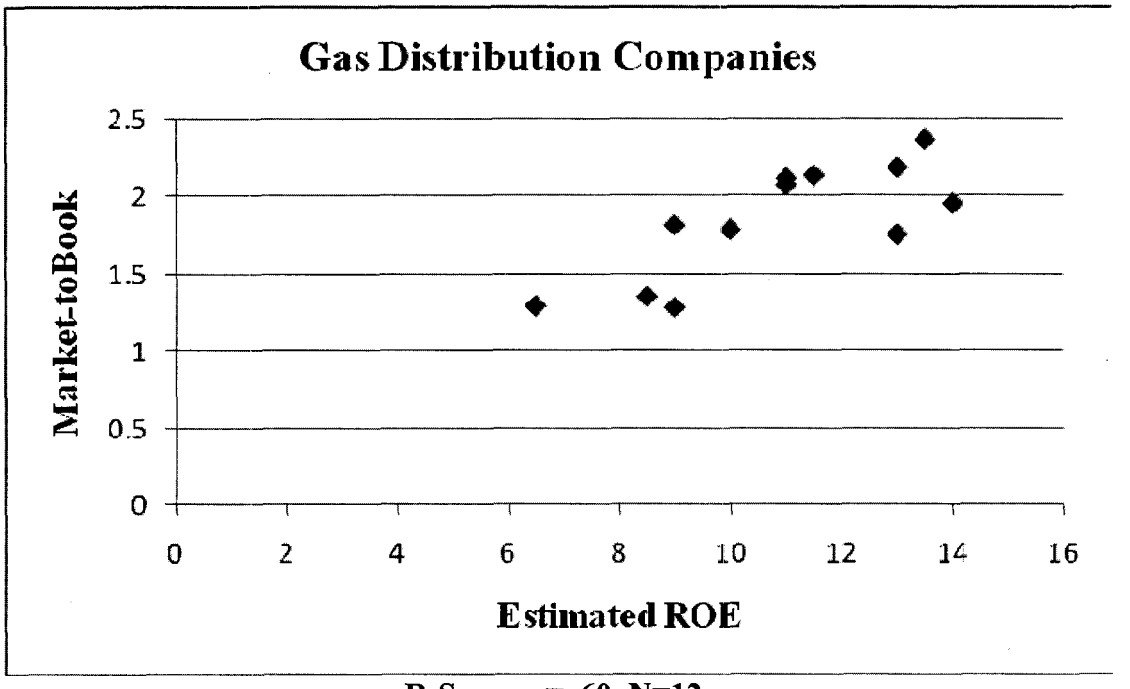
Exhibit JRW-6

Panel A



R-Square = .65, N=56.

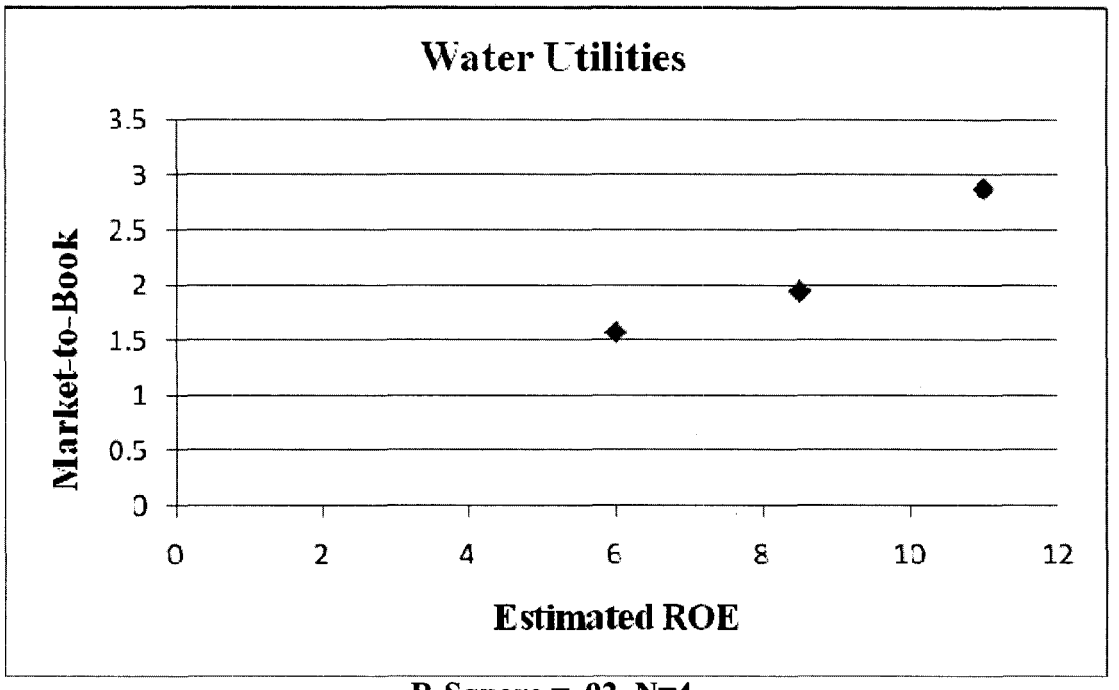
Panel B



R-Square = .60, N=12.

Exhibit JRW-6

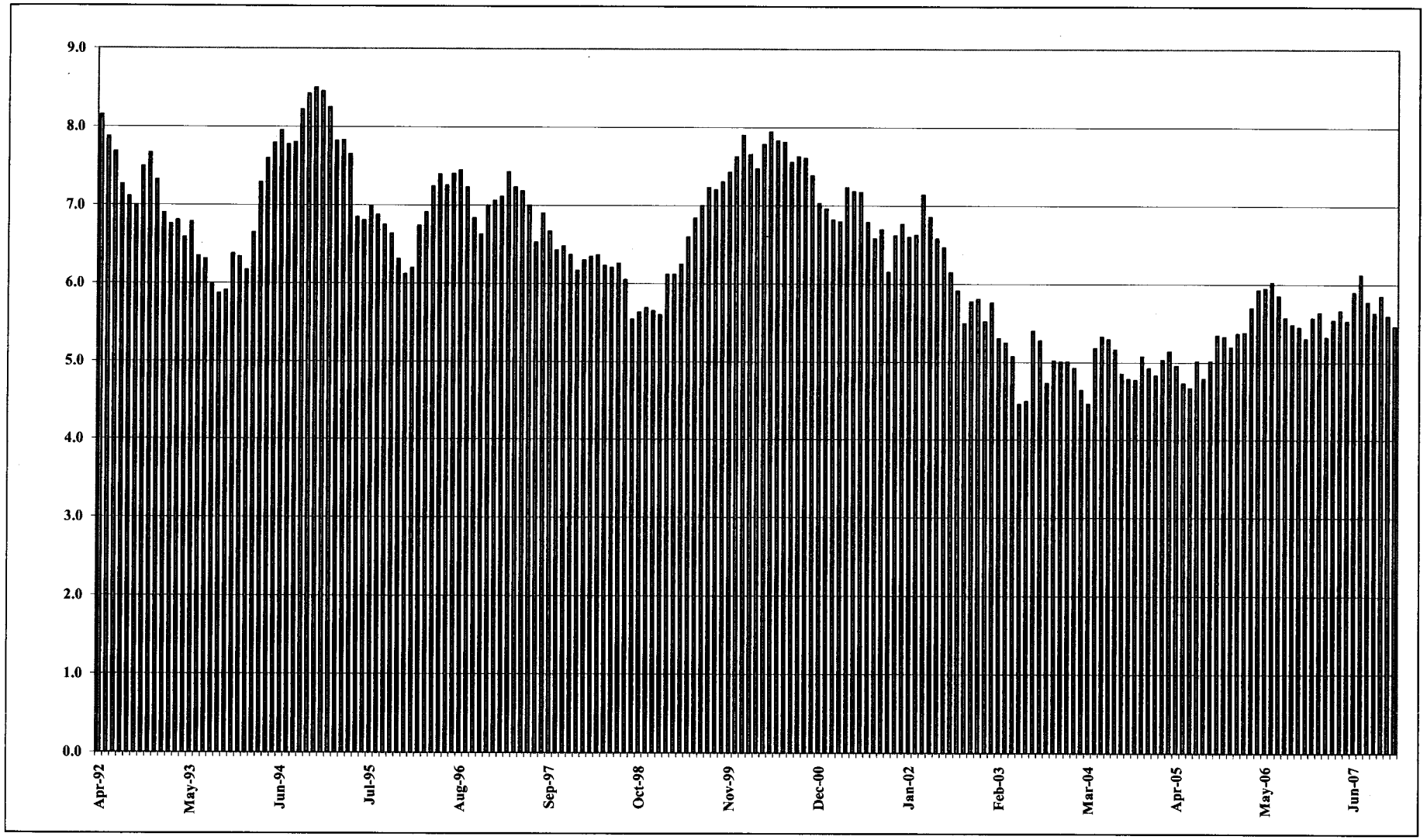
Panel C



R-Square = .92, N=4.

Exhibit JRW-7

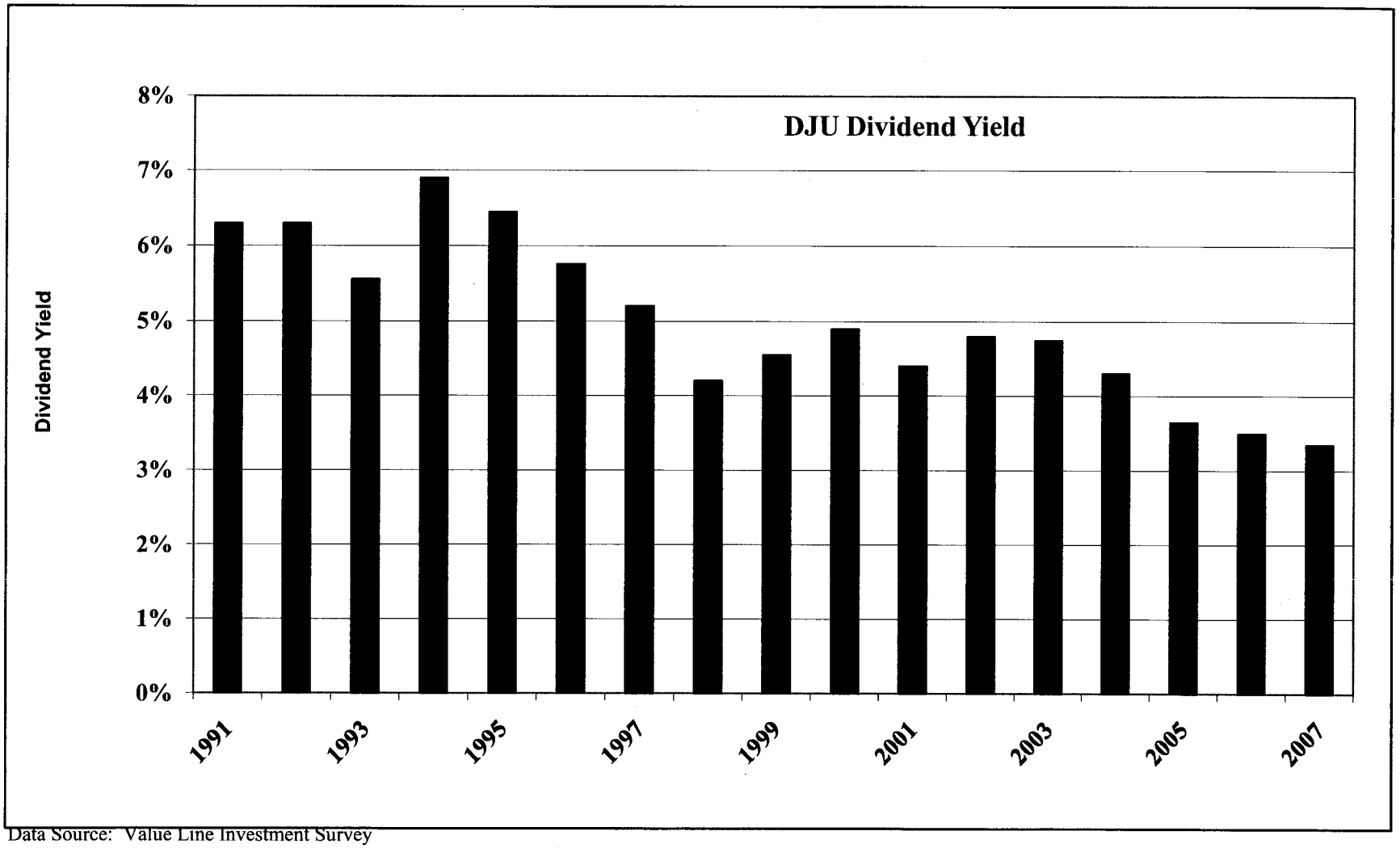
Long-Term 'A' Rated Public Utility Bonds



Data Source: Bloomberg (FMCI Function).

Exhibit JRW-4

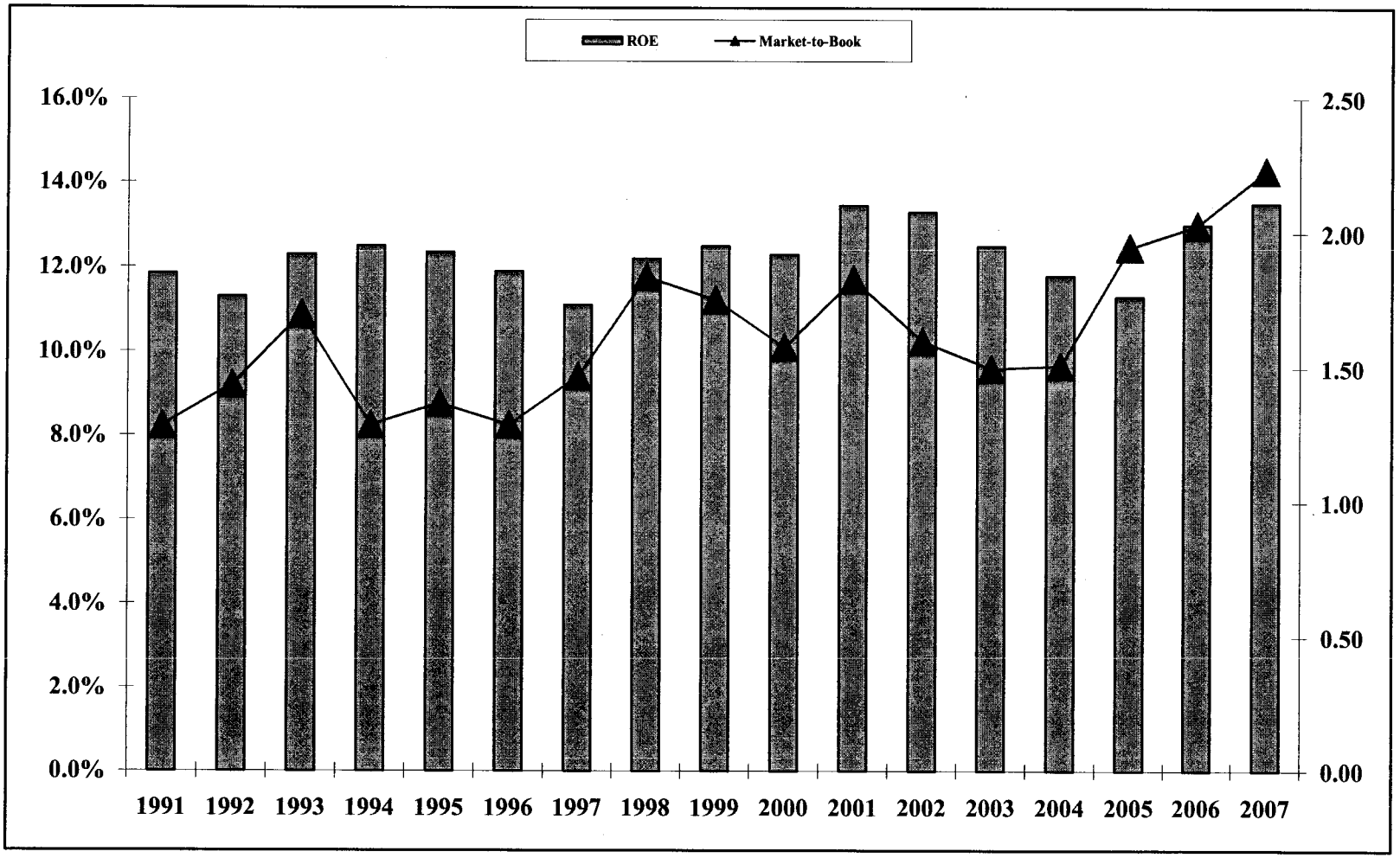
Dow Jones Utilities Dividend Yield



Data Source: Value Line Investment Survey

Exhibit JRW-7

Dow Jones Utilities - Market to Book and ROE



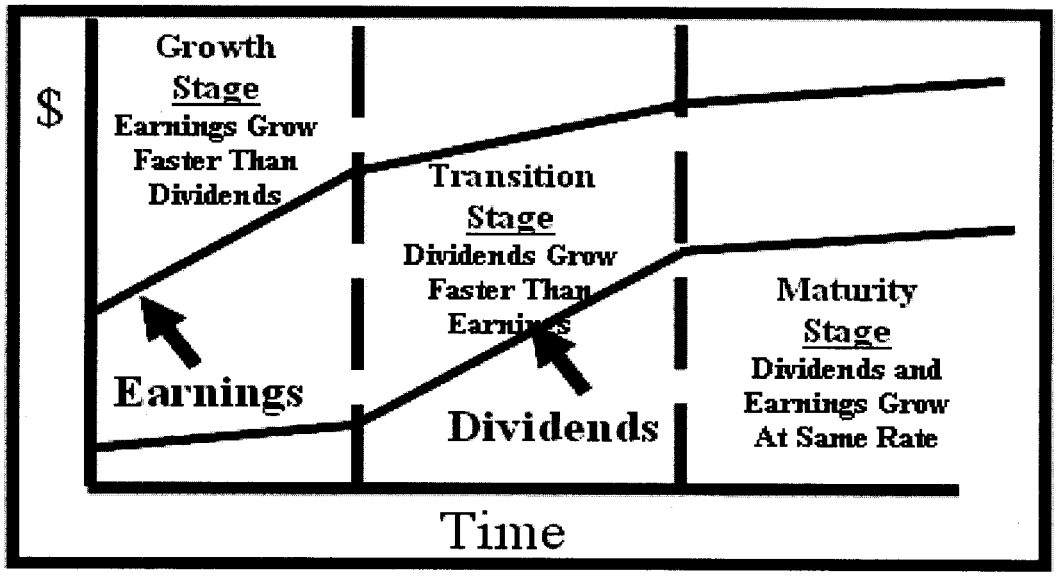
Data Source: Value Line Investment Survey

Exhibit JRW-8

Industry Average Betas

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

Exhibit JRW-9
Three-Stage DCF Model



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

Exhibit JRW-10

Peoples Gas System
Discounted Cash Flow Analysis

Gas Proxy Group

Dividend Yield*	4.1%
Adjustment Factor	1.02625
Adjusted Dividend Yield	4.2%
Growth Rate**	5.25%
Equity Cost Rate	9.5%

* Page 2 of Exhibit JRW-10

** Based on data provided on pages 3, 4, and 5 of Exhibit JRW-10

Exhibit JRW-10

Peoples Gas System
Monthly Dividend Yields
July-December 2008

Gas Proxy Group

Company	July	Aug	Sep	Oct	Nov	Dec	Mean
AGL Resources Inc. (NYSE-ATG)	4.9%	5.0%	5.1%	5.0%	6.0%	6.0%	5.3%
Atmos Energy Corporation (NYSE-ATO)	4.8%	5.1%	4.7%	4.6%	5.9%	6.0%	5.2%
Laclede Group, Inc. (NYSE-LG)	3.7%	3.9%	3.2%	3.0%	3.1%	3.1%	3.3%
NICOR Inc. (NYSE-GAS)	4.3%	4.8%	4.2%	3.7%	4.4%	4.4%	4.3%
Northwest Natural Gas Co. (NYSE-NWN)	3.2%	3.4%	3.1%	2.8%	3.5%	3.5%	3.2%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	3.8%	4.2%	3.7%	3.1%	3.4%	3.4%	3.6%
South Jersey Industries, Inc. (NYSE-SJI)	2.8%	2.9%	3.1%	2.8%	3.4%	3.4%	3.1%
Southwest Gas Corporation (NYSE-SWX)	2.9%	3.2%	3.0%	2.8%	3.6%	3.6%	3.2%
WGL Holdings, Inc. (NYSE-WGL)	4.0%	4.2%	4.3%	4.0%	5.3%	5.3%	4.5%
Mean	3.8%	4.1%	3.8%	3.5%	4.3%	4.3%	4.0%

Data Source: AUS *Utility Reports*, monthly issues.

Exhibit JRW-10

Peoples Gas System
DCF Equity Cost Growth Rate Measures
***Value Line* Historic Growth Rates**

Gas Proxy Group

Company	*Value Line* Historic Growth					
	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book Value	Earnings	Dividends	Book Value
AGL Resources Inc. (NYSE-ATG)	7.0%	2.5%	6.5%	15.0%	4.0%	10.5%
Atmos Energy Corporation (NYSE-ATO)	3.5%	2.5%	7.0%	7.5%	1.5%	9.0%
Laclede Group, Inc. (NYSE-LG)	3.0%	1.0%	3.0%	9.5%	1.0%	4.5%
NICOR Inc. (NYSE-GAS)	1.5%	3.5%	3.0%	-1.5%	1.0%	4.0%
Northwest Natural Gas Co. (NYSE-NWN)	3.0%	1.5%	3.5%	6.5%	2.0%	3.5%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	5.0%	5.0%	6.0%	6.0%	4.5%	6.5%
South Jersey Industries, Inc. (NYSE-SJI)	9.5%	2.5%	7.5%	12.5%	4.5%	12.5%
Southwest Gas Corporation (NYSE-SWX)	12.0%	0.0%	3.0%	6.0%	0.0%	3.5%
WGL Holdings, Inc. (NYSE-WGL)	2.0%	1.5%	4.0%	5.0%	1.5%	3.5%
Mean	5.2%	2.2%	4.8%	7.4%	2.2%	6.4%
Median	3.5%	2.5%	4.0%	6.5%	1.5%	4.5%
	Average of Mean and Median F			4.2%		

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

Exhibit JRW-10

Peoples Gas System
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Gas Proxy Group

Company	*Value Line* Projected Growth Est'd. '05-'07 to '11-'13			*Value Line* Internal Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
AGL Resources Inc. (NYSE-ATG)	3.0%	4.0%	1.5%	14.0%	41.0%	5.7%
Atmos Energy Corporation (NYSE-ATO)	4.5%	2.0%	3.5%	9.5%	42.0%	4.0%
Laclede Group, Inc. (NYSE-LG)	4.5%	2.5%	5.5%	11.5%	44.0%	5.1%
NICOR Inc. (NYSE-GAS)	5.0%	0.0%	5.0%	14.0%	49.0%	6.9%
Northwest Natural Gas Co. (NYSE-NWN)	7.0%	5.5%	3.5%	11.0%	44.0%	4.8%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	7.0%	4.0%	4.0%	13.0%	40.0%	5.2%
South Jersey Industries, Inc. (NYSE-SJI)	6.0%	5.5%	3.5%	16.5%	58.0%	9.6%
Southwest Gas Corporation (NYSE-SWX)	7.5%	4.0%	4.0%	9.5%	69.0%	6.6%
WGL Holdings, Inc. (NYSE-WGL)	3.5%	2.5%	5.0%	10.5%	39.0%	4.1%
Mean	5.3%	3.3%	3.9%	12.2%	47.3%	5.8%
Median	5.0%	4.0%	4.0%	11.5%	44.0%	5.2%
Average of Mean and Median Figures =		4.3%			Average =	5.5%

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

Exhibit JRW-10

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

Gas Proxy Group

		Zacks		Bloomberg			
Company	Sym	# Estimates	Mean	# Estimates	Mean	St. Dev	Average
AGL Resources	ATG	4	4.75%	5	4.00%	11.20%	4.38%
Atmos Energy	ATO	7	5.43%	6	4.83%	0.41%	5.13%
Lacleded Group	LG	1	10.00%	0	-	-	10.00%
Nicor Inc.	GAS	4	5.75%	4	4.38%	1.11%	5.06%
Northwest Natural Gas Company	NWN	4	6.50%	4	4.13%	1.75%	5.31%
Piedmont Natural Gas, Inc.	PNY	5	5.60%	1	5.00%	-	5.30%
South Jersey Industries	SJI	4	7.75%	3	7.33%	2.52%	7.54%
Southwest Gas	SWX	2	8.00%	3	5.33%	1.16%	6.67%
WGL Holdings, Inc.	WGL	2	7.50%	1	4.00%	-	5.75%
Median							5.31%

Data Sources: Bloomberg , November, 2008

Exhibit JRW-10

Peoples Gas System
DCF Growth Rate Indicators

Gas Proxy Group

Growth Rate Indicator	
Historic Value Line Growth in EPS, DPS, and BVPS	4.20%
Projected *Value Line* Growth in EPS, DPS, and BVPS	4.30%
Internal Growth ROE * Retention Rate	5.50%
Projected EPS Growth from Bloomberg and Zacks	5.31%

Exhibit JRW-11

Capital Asset Pricing Model

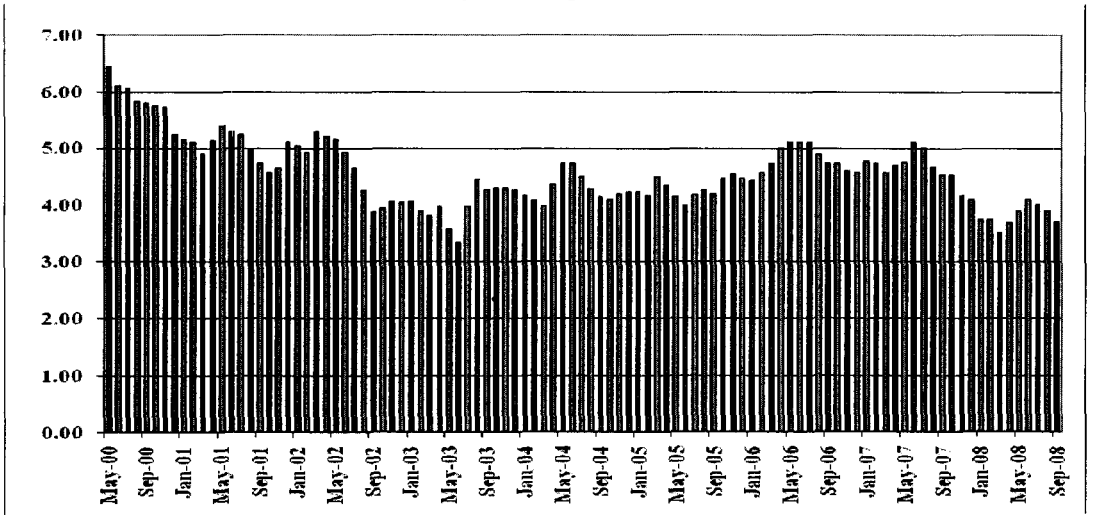
Gas Proxy Group

Risk-Free Interest Rate	**3.50%**
Beta*	**0.82**
Ex Ante Equity Risk Premium**	**4.78%**
CAPM Cost of Equity	**7.4%**

* See page 2 of Exhibit JRW-11

** See page 3 of Exhibit JRW-11

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



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

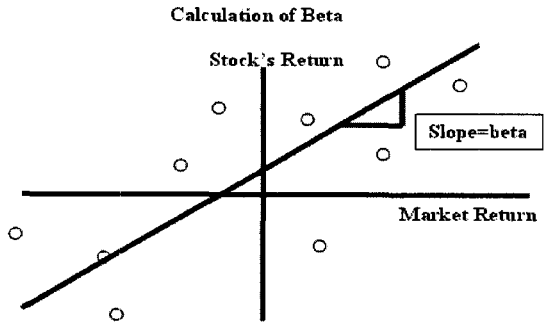
U.S. Treasury Yields

U.S. Treasuries

	COUPON	MATURITY DATE	CURRENT PRICE/YIELD
3-MONTH	0.000	03/19/2009	0.01 / .01
6-MONTH	0.000	06/18/2009	0.18 / .18
12-MONTH	0.000	12/17/2009	0.4 / .41
2-YEAR	1.250	11/30/2010	101-06+ / .63
3-YEAR	1.125	12/15/2011	100-24+ / .86
5-YEAR	2.000	11/30/2013	103-25+ / 1.20
10-YEAR	3.750	11/15/2018	114-24½ / 2.09
30-YEAR	4.500	05/15/2038	138-14 / 2.62

Source: www.bloomberg.com

Exhibit JRW-11



Gas Proxy Group

Company	Beta
AGL Resources Inc. (NYSE-ATG)	**0.85**
Atmos Energy Corporation (NYSE-ATO)	**0.80**
Laclede Group, Inc. (NYSE-LG)	**0.80**
NICOR Inc. (NYSE-GAS)	**0.90**
Northwest Natural Gas Co. (NYSE-NWN)	**0.75**
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	**0.80**
South Jersey Industries, Inc. (NYSE-SJI)	**0.80**
Southwest Gas Corporation (NYSE-SWX)	**0.80**
WGL Holdings, Inc. (NYSE-WGL)	**0.85**
Mean	**0.82**

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

Exhibit JRW-11

Peoples Gas System
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).

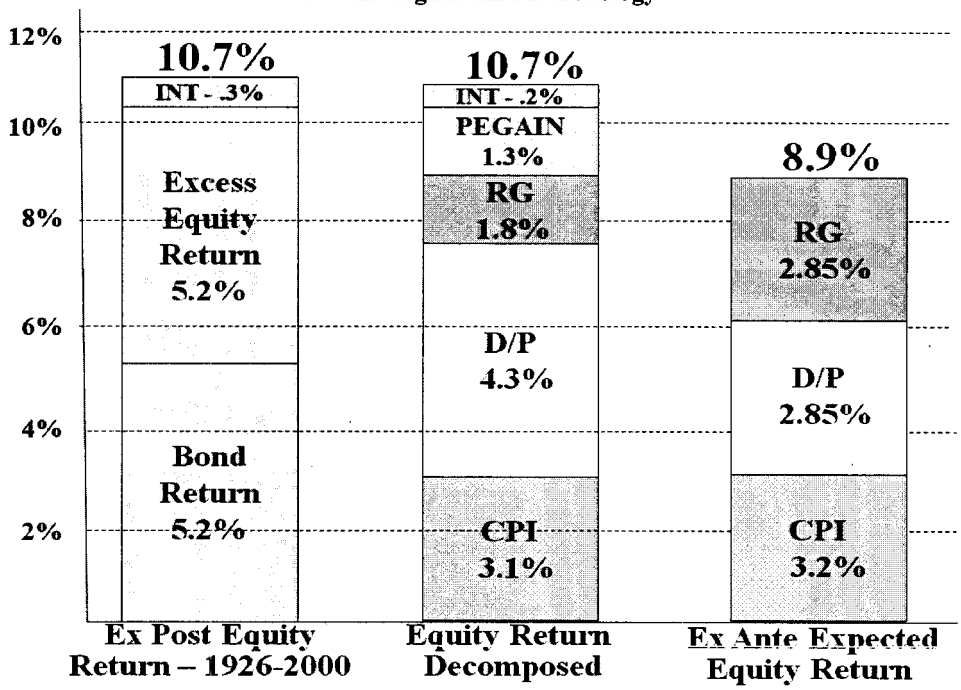
Exhibit JRW-11

Peoples Gas System
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					3.99%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%		5.37%	
	AVERAGE									3.77%
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)					6.28%	
	AVERAGE									5.76%
OVERALL AVERAGE										**4.78%**

Exhibit JRW-11

Peoples Gas System
Decomposing Equity Market Returns
The Building Blocks Methodology



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

Exhibit JRW-11

Peoples Gas System
Decomposing Equity Market Returns
The Building Blocks Methodology

Expected Inflation Rate
University of Michigan Consumer Research

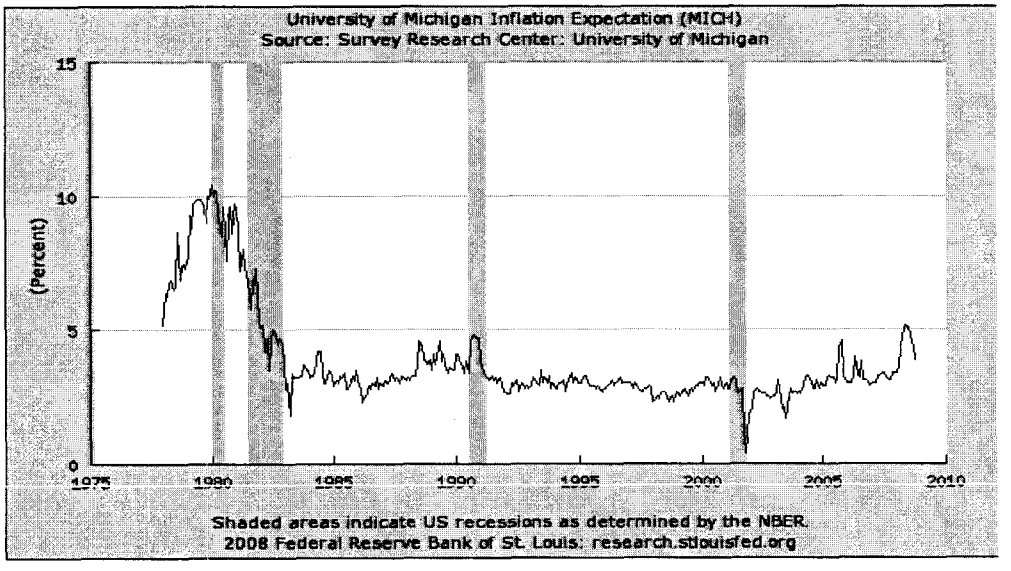


Exhibit JRW-11

Peoples Gas System

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

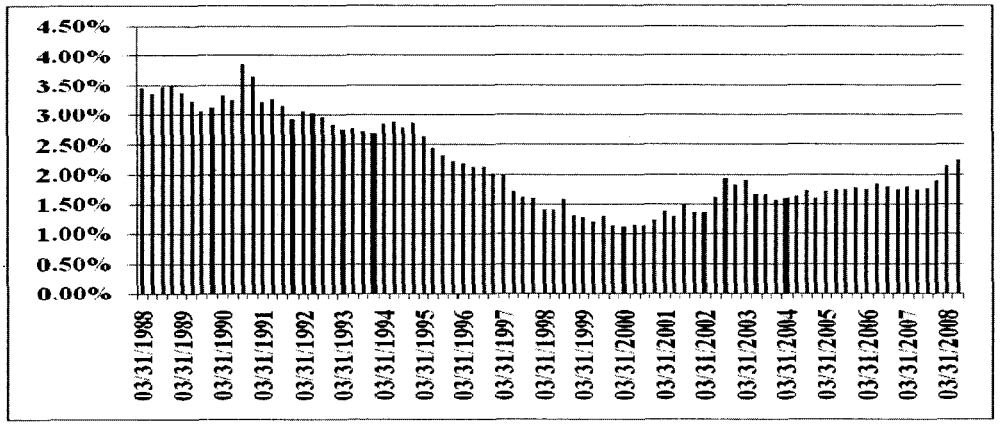
SERIES: BILL RETURNS (3-MONTH)	
STATISTIC	
MINIMUM	2.400
LOWER QUARTILE	3.000
MEDIAN	4.000
UPPER QUARTILE	4.250
MAXIMUM	5.300
MEAN	3.840
STD. DEV.	0.680
N	38
MISSING	12

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

Exhibit JRW-11

Peoples Gas System
Decomposing Equity Market Returns
The Building Blocks Methodology

S&P 500 Dividend Yield



S&P 500 PE Ratios

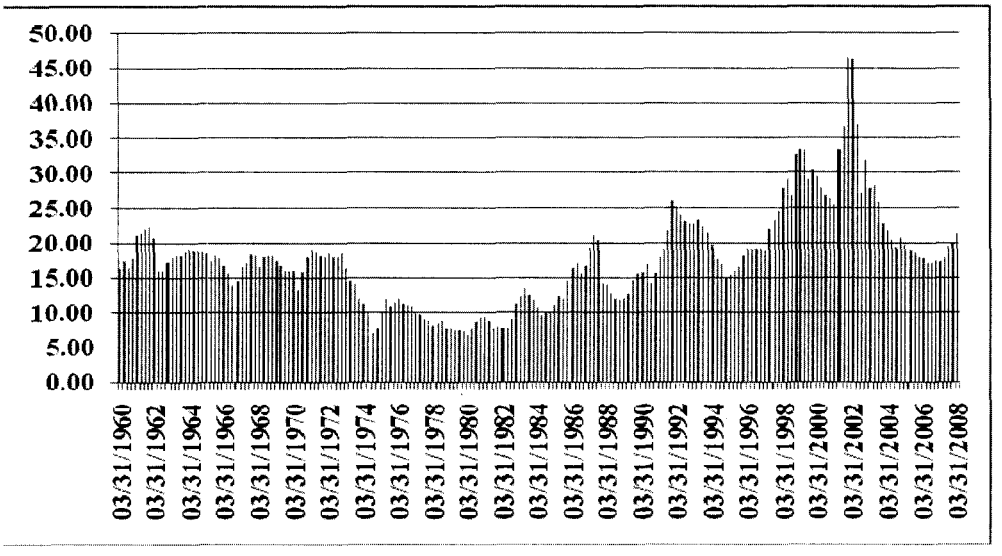


Exhibit JRW-11

Peoples Gas System
CAPM
Real S&P 500 EPS Growth Rate

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

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

	TECO Energy, Inc.		Comparable Gas Companies	
Approach	**Low**	**High**	**Low**	**High**
CAPM	**12.27%**	**13.65%**	**12.46%**	**13.01%**
Earnings Growth DCF	**10.08%**	**11.90%**	**9.72%**	**11.02%**
Projected Growth DCF	**8.21%**	**11.40%**	**7.04%**	**10.04%**

Panel B
Summary of Dr. Murry's DCF Results

	TECO Energy, Inc.		Comparable Gas Companies	
Approach	**Low**	**High**	**Low**	**High**
52 Week DCF				
Using DPS Growth	2.19%	4.00%	6.41%	7.72%
Using VL EPS Growth	10.08%	11.90%	9.72%	**11.02%**
Using VL-Yahoo Growth	8.21%	11.40%	7.04%	**10.04%**
Current DCF				
Using DPS Growth	2.32%	2.44%	6.87%	6.94%
Using VL EPS Growth	10.22%	10.34%	10.18%	10.24%
Using VL- Yahoo Growth	8.34%	9.84%	7.50%	9.26%

Panel C
Summary of Dr. Murry's CAPM Results

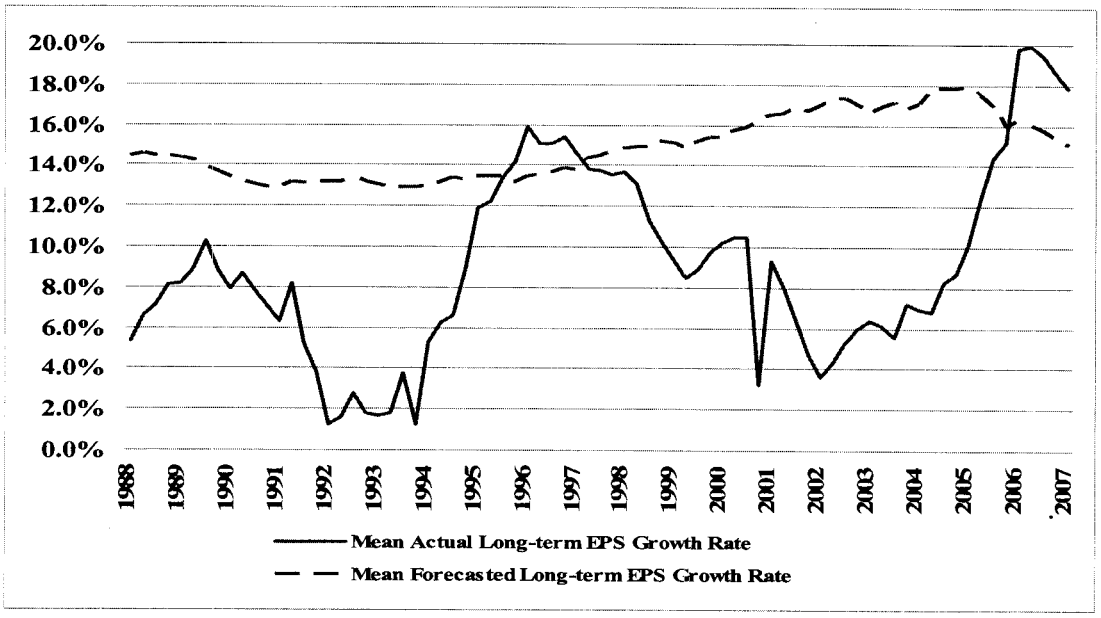
Size Adjusted CAPM

	TECO Energy	**Comparable Gas Companies**
Risk-Free Rate	4.60%	4.60%
Beta	0.95	0.88
Equity Risk Premium	7.10%	7.10%
CAPM Equity Cost Rate	11.35%	10.81%
Size Adjustment Premium	0.92%	1.65%
CAPM Equity Cost Rate	**12.27%**	**12.46%**

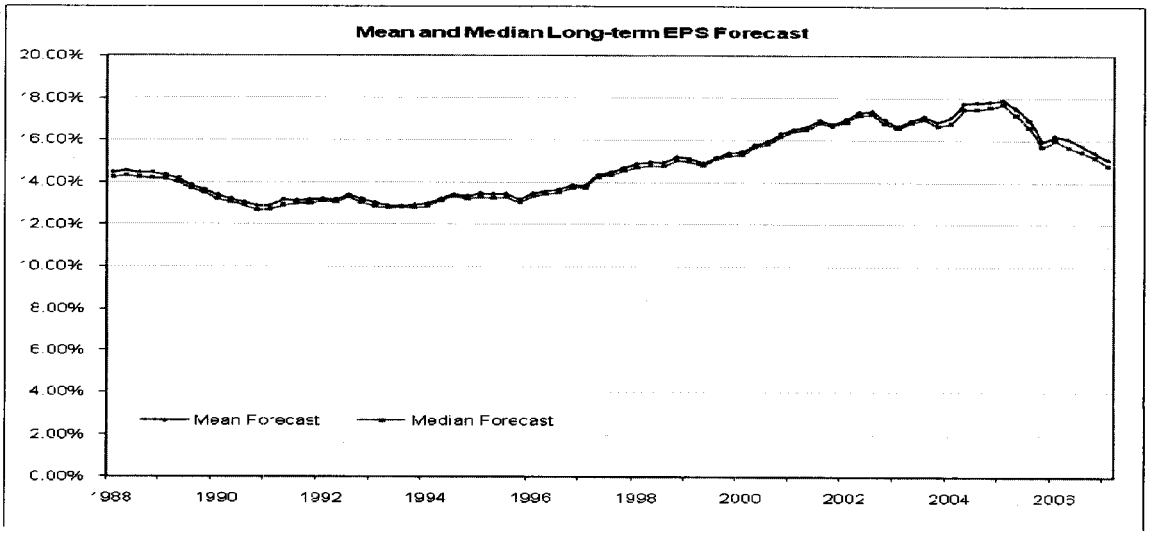
Historical CAPM

	TECO Energy	**Comparable Gas Companies**
Market Return	14.70%	14.70%
L-T Bond Return	6.20%	6.20%
Risk Premium	8.50%	8.50%
Weighting	0.95	0.88
Adjusted Risk Premium	8.08%	7.44%
Aaa Corporate Bond Return	5.57%	5.57%
CAPM Equity Cost Rate	13.65%	13.01%

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



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



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

THE WALL STREET JOURNAL.

Study Suggests Bias in Analysts' Rosy Forecasts

By ANDREW EDWARDS
March 21, 2008; Page C6

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

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

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

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

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

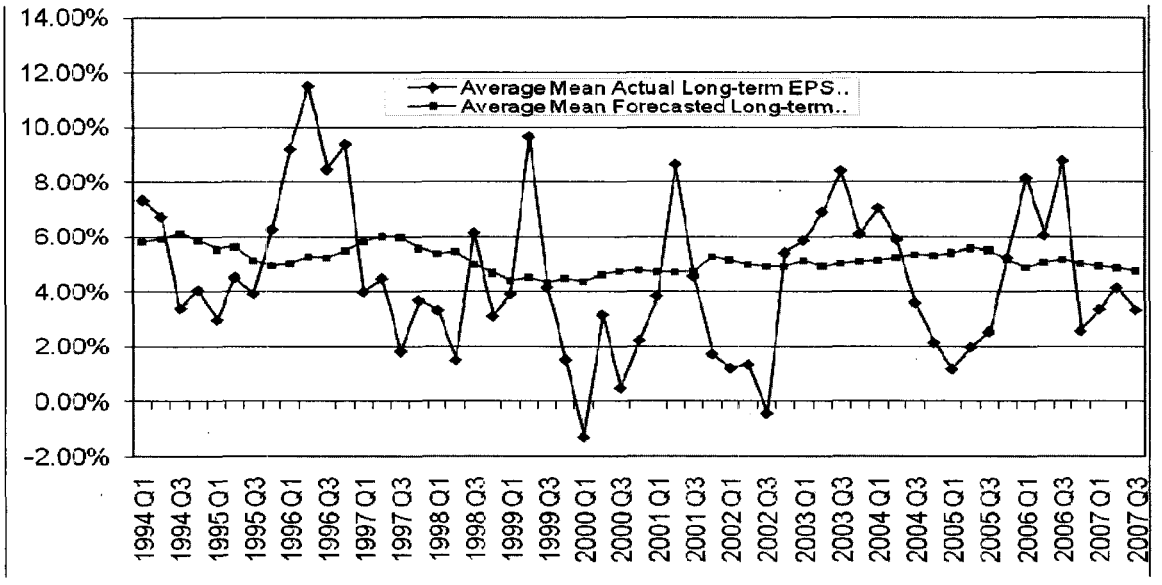
"A significant factor in the upward bias in long-term earnings-rate forecasts is the reluctance of analysts to forecast" profit declines, Mr. Woolridge said. The study found that nearly one-third of all companies experienced profit drops over successive three-to-five-year periods, but analysts projected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

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

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

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

Panel C
Long-Term Forecasted Versus Actual EPS Growth Rates
Natural Gas Distribution Companies
1988-2007

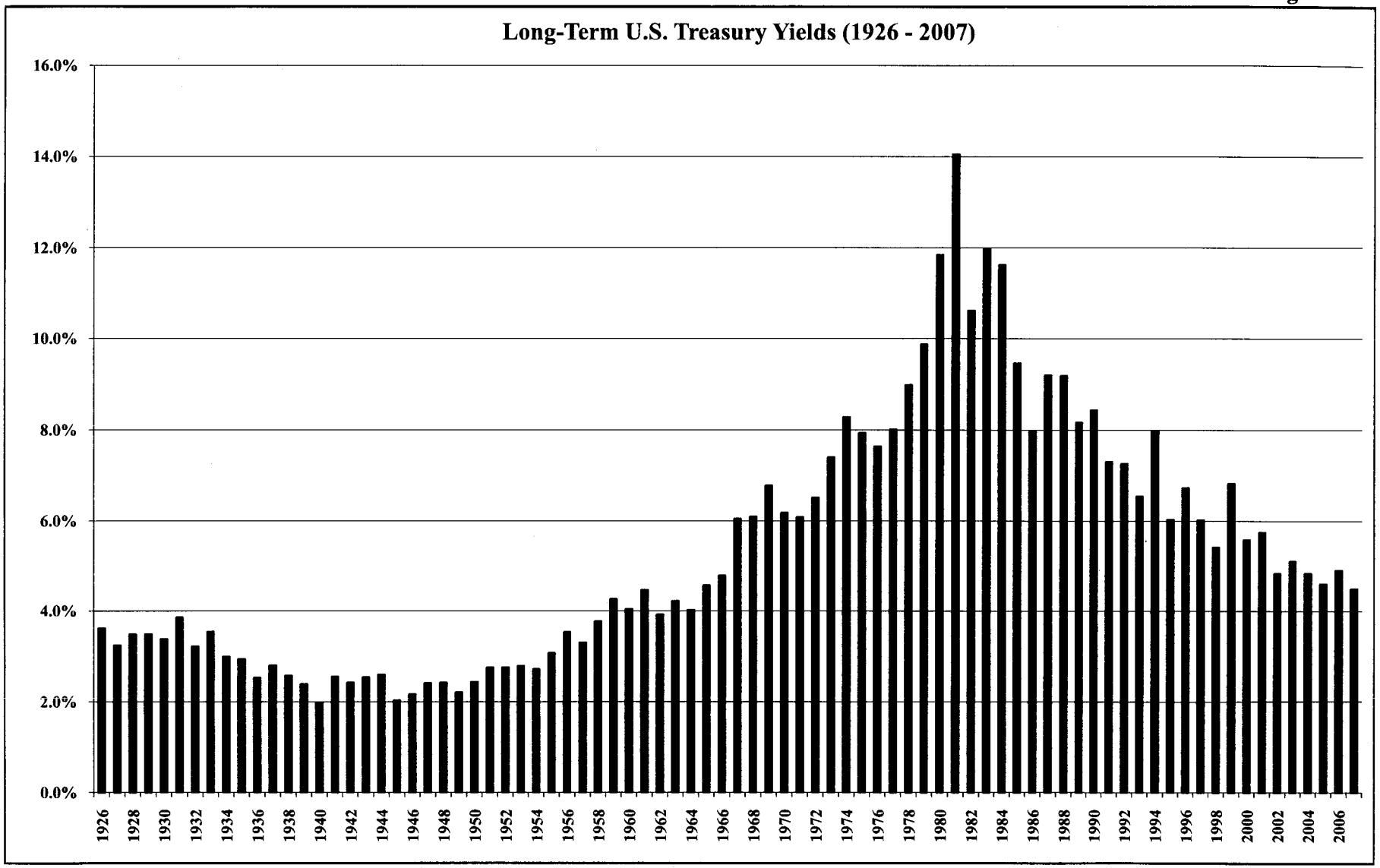


Panel A
Value Line 3-5 year EPS Growth Rate Forecasts

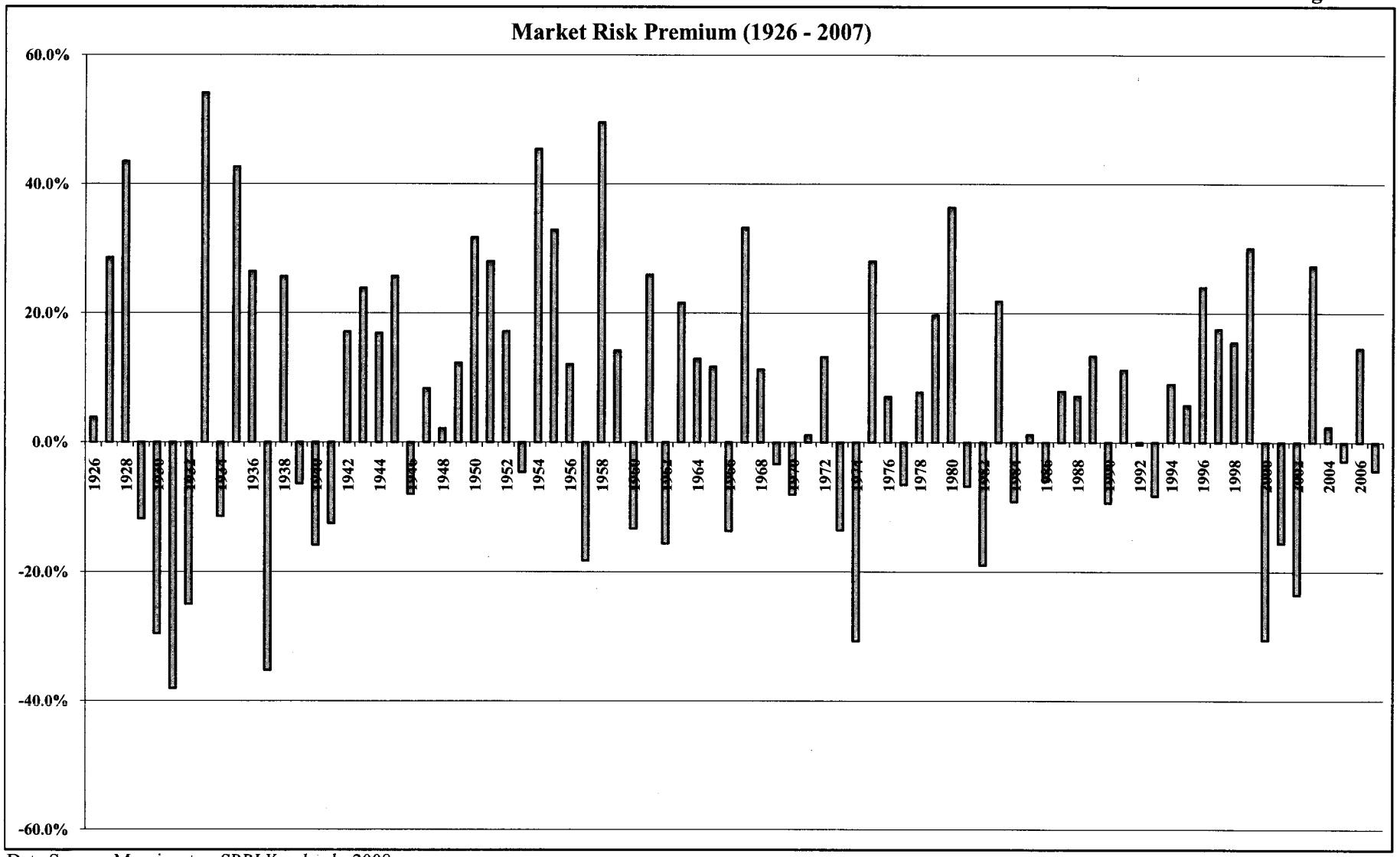
	Average Projected EPS Growth rate	Number of Negative EPS Growth Projections	Percent of Negative EPS Growth Projections
2,453 Companies	14.60%	47	1.90%

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

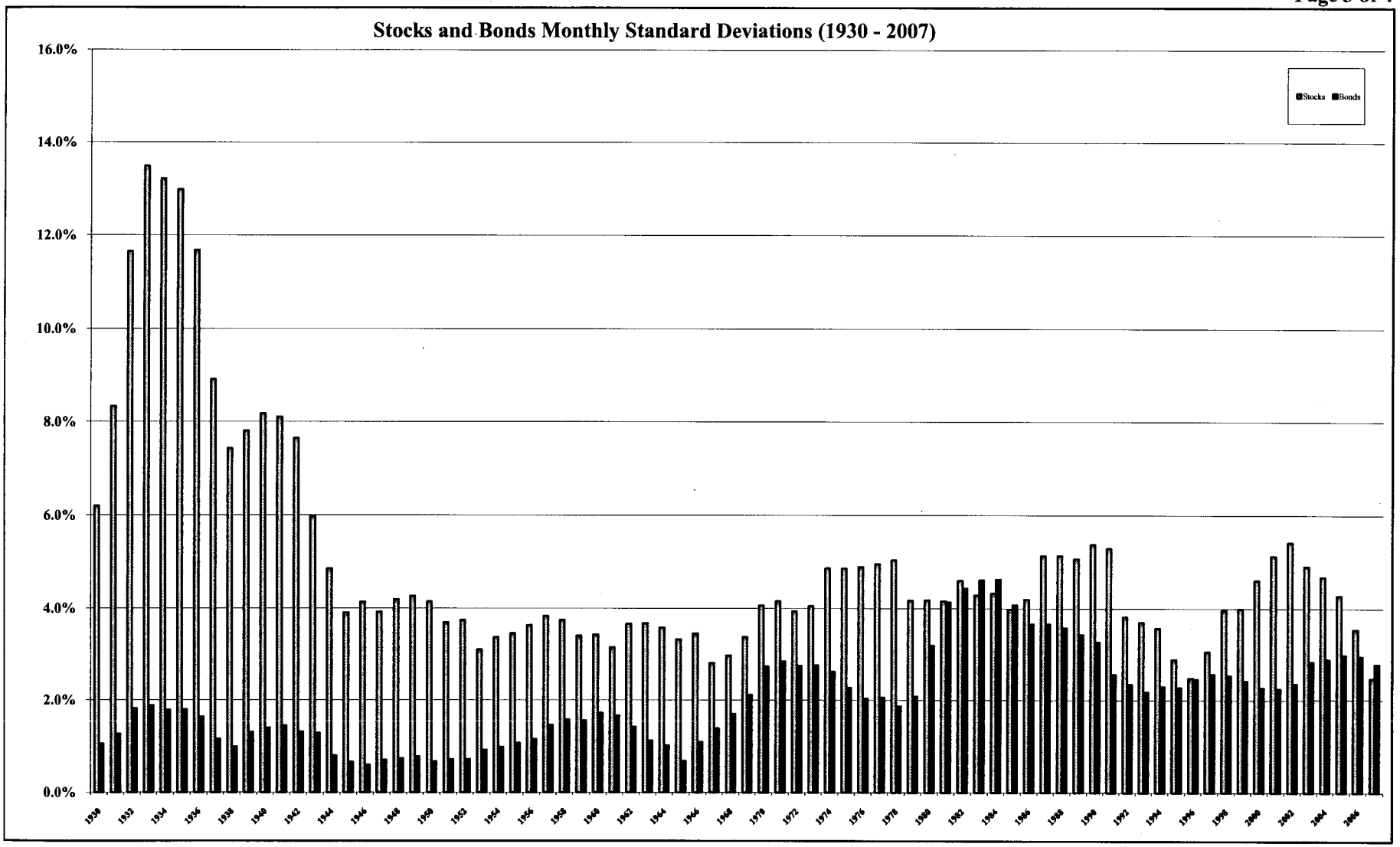
	Average Historical EPS Growth rate	Number with Negative Historical EPS Growth	Percent with Negative Historical EPS Growth
2,371 Companies	12.90%	476	20.10%



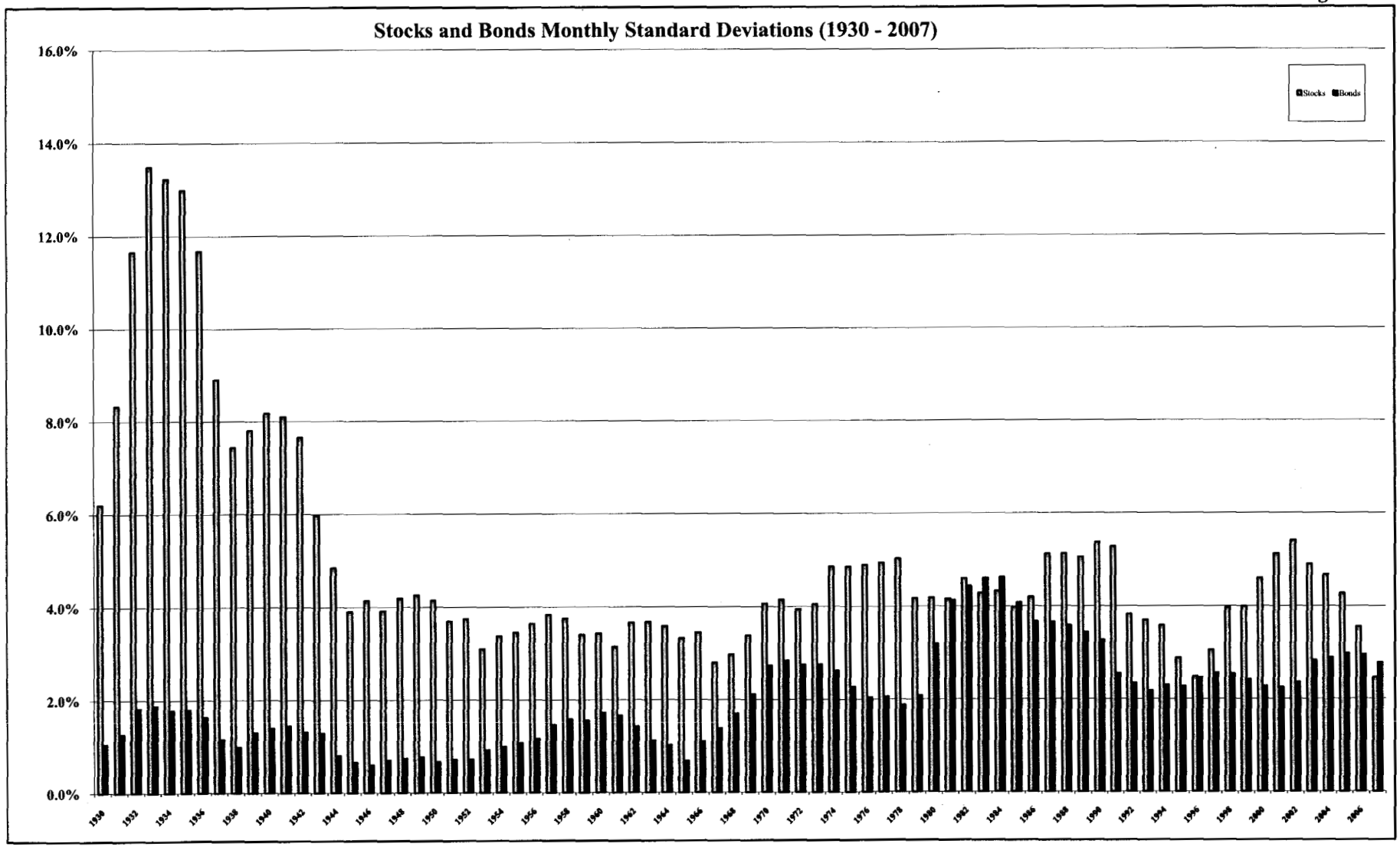
Data Source: Morningstar, *SBBI Yearbook*, 2008.



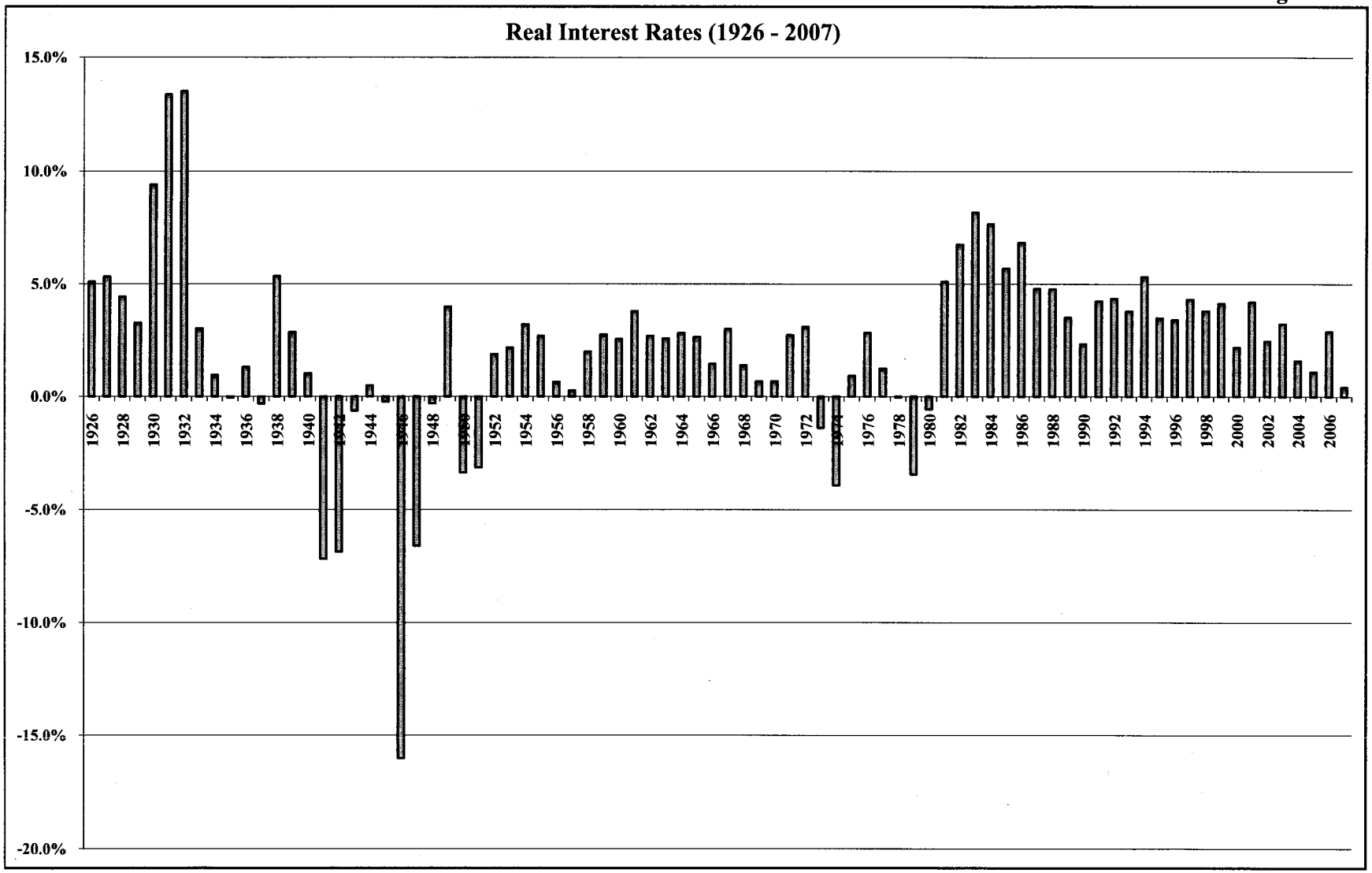
Data Source: Morningstar, *SBBI Yearbook*, 2008.



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

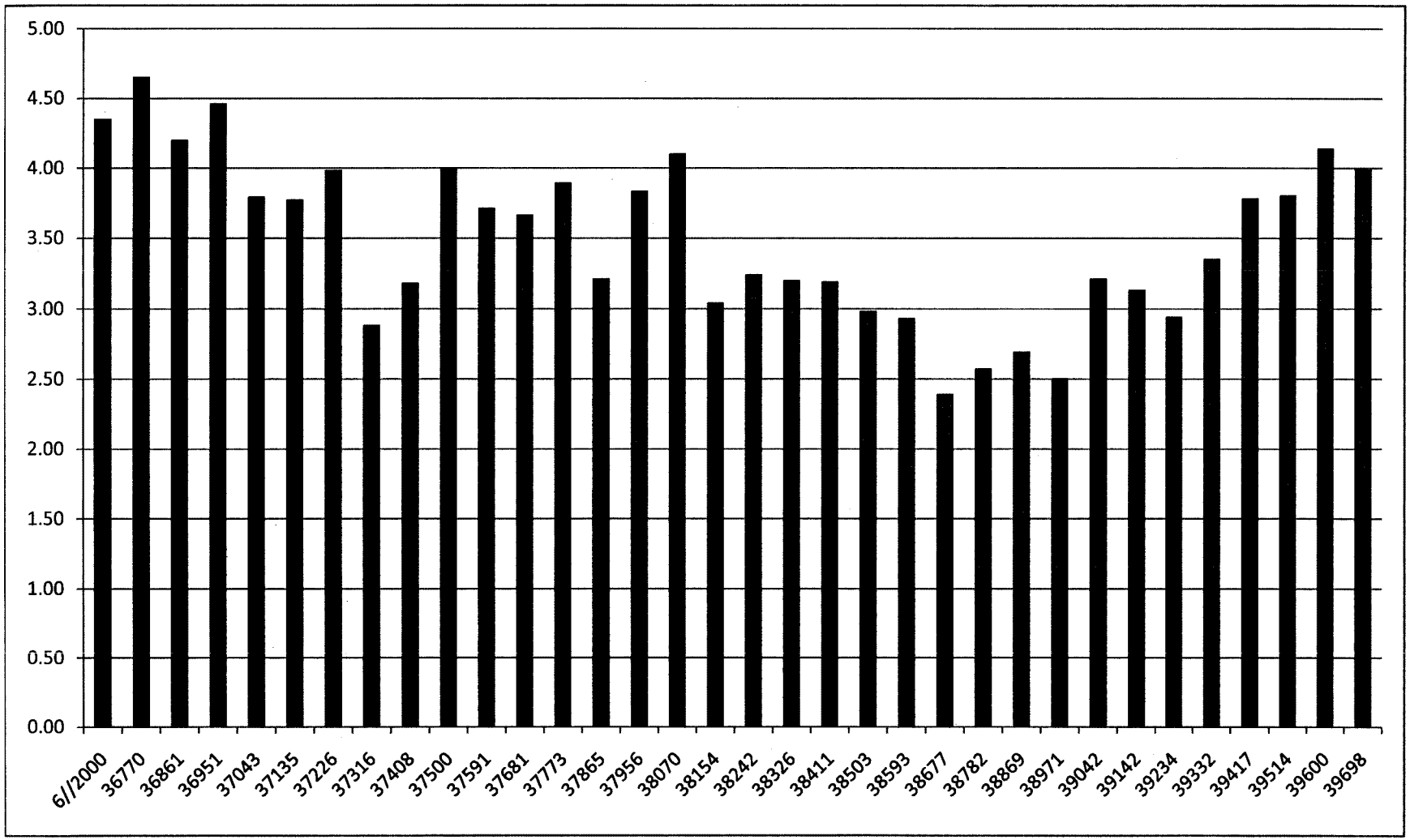


Data Source: Morningstar, *SBBI Yearbook*, 2008.



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

CFO's Equity Risk Premium
2000-2008



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

CERTIFICATE OF SERVICE
DOCKET NO. 080318-GU

I HEREBY CERTIFY that a true and correct copy of the Direct Testimony of Dr. J. Randall Woolridge, has been furnished by hand delivery or U.S. Mail to the following parties on this 18th day of December, 2008.

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