BEFORE THE CORPORATION COMMISSION

OF THE STATE OF KANSAS

IN THE MATTER OF THE APPLICATION OF KANSAS GAS SERVICE, A DIVISION OF ONEOK, INC., FOR ADJUSTMENT OF ITS NATURAL GAS RATES IN THE STATE OF KANSAS.	]]]]]	KCC Docket No. 12-KGSG-835-RTS

DIRECT TESTIMONY OF

DR. J. RANDALL WOOLRIDGE

RE: COST OF CAPITAL

ON BEHALF OF

THE CITIZENS' UTILITY RATEPAYER BOARD

September 24, 2012

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DIRECT TESTIMONY
OF
DR. J. RANDALL WOOLRIDGE

I. IDENTIFICATION OF WITNESS AND PURPOSE OF TESTIMONY

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.

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

A. I have been asked by the staff of the Citizens' Utility Ratepayer Board ("CURB") to provide an opinion as to the overall fair rate of return or cost of capital for the Kansas Gas Service ("KGS" or the "Company") and evaluate the Company's rate of return testimony in this proceeding.

Q. HOW IS YOUR TESTIMONY ORGANIZED?

A. First I will review my cost of capital recommendation for KGS and review the primary differences between KGS's rate of return position and CURB's position. Second, I provide an assessment of capital costs in today's capital markets. Third, I discuss my proxy group of gas distribution companies for estimating the cost of capital for KGS. Fourth, I present my recommendations for the Company's capital structure. Fifth, I discuss the concept of the cost of equity capital, and then estimate the equity cost rate for KGS. Finally, I critique the Company's rate of return analysis and testimony. A table of contents is provided just after the title page.

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

A. I initially show that capital costs as measured by interest rates are at historically low levels. I have used a capital structure consisting of 50% debt and 50% equity, which is the Company's stated goal. To estimate the cost of equity capital, I applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to a proxy group of publicly-held natural gas distribution companies ("Gas Proxy Group"). The result of my analysis indicates that an equity cost rate of 8.5% is appropriate for KGS.

Using my proposed capital structure and debt and equity cost rates, I am recommending an overall rate of return of 6.92% for KGS.

Q. PLEASE SUMMARIZE THE PRIMARY DIFFERENCES BETWEEN YOUR RATE OF RETURN ANALYSIS AND THE COMPANY'S RATE OF RETURN ANALYSIS IN THIS PROCEEDING.

A. Mr. Bruce H. Fairchild provides the Company's proposed capital structure, debt and equity cost rates, and overall rate of return. Mr. Fairchild has used DCF and CAPM approaches, as well as Risk Premium ("RP"), and Comparable Earnings ("CE") approaches. Mr. Fairchild applies these models to a proxy group of gas distribution companies. The Company recommends an overall rate of return of 8.52%.

The primary differences between my methodology and the Company's methodology for calculating an appropriate rate of return are as follows:

The appropriate capital structure - KGS employs a capital structure that includes a common equity ratio of 58.85%. This is well above the common equity ratios of KGS' parent company, ONEOK, and above the average common equity ratios of gas distribution companies. ONEOK has stated that its capital structure goal is 50% debt and 50% equity. A related issue is the use of short-term debt by gas companies. ONEOK's stated capitalization goal of 50% debt and 50% equity includes all debt. The proxy group of natural gas companies used in my analysis employs short-term debt as a source of capital to fund investments. With the increased use of construction work in progress (CWIP) capital being included in rates, and the increased use of capital replacement riders that are updated (or even

forecasted) at least annually, short-term debt is funding investments that are rapidly placed into rates.

The Company's DCF equity cost rate is inflated - Mr. Fairchild's DCF model produces an excessive equity cost rate because he uses a DCF growth rate range of 5.50% to 6.50%. There are three errors with this range. First, he has subjectively eliminated DCF growth rate measures because they produce, in his opinion, an equity cost rate that is too low. Second, Mr. Fairchild's DCF equity cost rate is inflated by his excessive reliance on the projected long-term earnings growth rates of Wall Street analysts and *Value Line.* I provide evidence that these growth rates are overly optimistic and upwardly-biased. Third, I perform an analysis of the fifteen DCF growth rate indicators reviewed by Mr. Fairchild. I show that these indicators support a growth rate range of 4.50% to 5.0% and not 5.50% to 6.50%.

In developing a DCF growth rate, I use both historic and projected growth rate measures and have evaluated growth in dividends, book value, and earnings per share to inform my recommendation.

An unrealistic long term EPS growth rate in the CAPM analysis - Mr. Fairchild uses a long term EPS growth rate of 11.0% for S&P 500 companies in developing a market risk premium in his CAPM analysis. A projected EPS growth of 11.0% is inconsistent with historic and projected economic and earnings growth in the U.S and the use of this unrealistic EPS growth number leads to and inflated market risk premium in Mr. Fairchild's analysis. Mr. Fairchild's estimates suggest that companies in the U.S. would

be expected to: (1) increase their growth rate of EPS by almost 100.0% in the future, and (2) maintain that growth rate indefinitely in the future. I provide empirical evidence that this is highly unrealistic in an economy where the historical and projected long-run growth rates in GDP, S&P, and S&P DPS are in the 5.0% to 7.0% range. Mr. Fairchild's CAPM equity cost rate is simply not a credible analysis.

I used an equity risk premium of 5.0% in my CAPM, which is consistent with the equity risk premiums: (1) discovered in recent academic studies by leading finance scholars; (2) employed by leading investment banks and management consulting firms; and (3) that result from surveys of financial forecasters, analysts, companies, and corporate CFOs.

An inflated size adjustment and unsupported floatation costs - Mr. Fairchild increases his equity results by 1.81% as an adjustment for the size of the companies in his proxy group. He then increases his results again by adding in an additional return to compensate for floatation costs, even though there is no evidence that the company incurred cost in issuing equity. I do not artificially inflate the results of my analysis. I provide current academic evidence that utility stocks, because of regulation and standardized accounting do not exhibit a significant size premium and it is therefore inappropriate to include a size adjustment in a rate of return analysis in this case.

Overall, the flaws in Mr. Fairchild's analysis inflate the return on equity and overall rate of return in the company's request. The Commission

should reject Mr. Fairchild's analysis and adopt my capital structure, return on equity and overall rate of return recommendations.

In the end, the areas of disagreement in measuring KGS's cost of capital are: (1) the appropriate capital structure for KGS; (2) the expected DCF growth rate, and in particular Mr. Fairchild's elimination of low DCF equity cost rates as well as the use of the projected growth rates of Wall Street analysts to measure expected DCF growth; (3) the base interest rate in the CAPM and RP approaches; (5) the measurement and magnitude of the equity risk premium used in CAPM and RPM approaches; (6) the validity of the CE equity cost rate approach; and (7) the Company's adjustments for size and flotation costs.

II. CAPITAL COSTS IN TODAY'S MARKETS

Q. PLEASE DISCUSS CAPITAL COSTS IN U.S. MARKETS.

A. Long-term capital cost rates for U.S. corporations are a function of the required returns on risk-free securities plus a risk premium. The risk-free rate of interest is the yield on long-term U.S Treasury yields. The yields on ten-year U.S. Treasury bonds from 1953 to the present are provided on page 1 of Exhibit JRW-2. These yields peaked in the early 1980s and have generally declined since that time. In the summer of 2003, these yields hit a 60-year low at 3.33%. They subsequently increased and fluctuated between the 4.0% and 5.0% levels over the next four years in response to ebbs and flows in the

economy. Ten-year Treasury yields began to decline in mid-2007 at the beginning of the financial crisis. In 2008 Treasury yields declined to below 3.0% as a result of the expansion of the mortgage and subprime market credit crisis, the turmoil in the financial sector, the government bailout of financial institutions, the monetary stimulus provided by the Federal Reserve, and the economic recession. From 2008 until 2011, these rates fluctuated between 2.5% and 3.5%. Over the past six months, the yields on ten-year Treasuries have declined from 2.5% to below 2.0% as the Federal Reserve has continued to support a low interest rate environment and economic uncertainties have persisted.

Panel B on page 1 of Exhibit JRW-2 shows the differences in yields between ten-year Treasuries and Moody's Baa rated bonds since the year 2000. This differential primarily reflects the additional risk required by bond investors for the risk associated with investing in corporate bonds. The difference also reflects, to some degree, yield curve changes over time. The Baa rating is the lowest of the investment grade bond ratings for corporate bonds. The yield differential hovered in the 2.0% to 3.0% range until 2005, declined to 1.5% until late 2007, and then increased significantly in response to the financial crisis. This differential peaked at 6.0% at the height of the financial crisis in early 2009, due to tightening in credit markets, which increased corporate bond yields and the "flight to quality," which decreased treasury yields. The differential subsequently declined and has been in the 2.5% to 3.0% range over the past three years.

As previously noted, the risk premium is the return premium required by investors to purchase riskier securities. The risk premium required by investors to buy corporate bonds is observable based on yield differentials in the markets. The equity risk premium is the return premium required to purchase stocks as opposed to bonds. The equity risk premium is not readily observable in the markets (as are bond risk premiums) since expected stock market returns are not readily observable. As a result, equity risk premiums must be estimated using market data. There are alternative methodologies to estimate the equity risk premium, and these alternative approaches and equity risk premium results are subject to 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% to 7% range. However, studies by leading academics indicate the forward-looking equity risk premium is actually in the 4.0% to 5.0% range. These lower equity risk premium results are in line with the findings of equity risk premium surveys of CFOs, academics, analysts, companies, and financial forecasters.

Q. PLEASE REVIEW THE FINANCIAL CRISIS AND THE RESPONSE OF THE U.S. GOVERNMENT.

A. The mortgage crisis, subprime crisis, credit crisis, economic recession and the restructuring of financial institutions have had tremendous global economic implications. This issue first surfaced in the summer of 2007 as a mortgage

crisis. It expanded into the subprime area in 2008 and led to the collapse of certain financial institutions, notably Bear Stearns, in the first quarter of 2008. Commodity and energy prices peaked and began to decline in the summer of 2008, as the crisis in the financial markets spread to the global economy. The turmoil in the financial sector peaked in September of 2008 with the failure of several large financial institutions, Bank of America's buyout of Merrill Lynch, and the government takeover of Fannie Mae and Freddie Mac.

In response to the market crisis, the Federal Reserve ("Fed") took extraordinary steps in an effort to stabilize capital markets. Most significantly, the Fed opened its lending facilities to numerous banking and investment firms to promote credit markets. As a result, the balance sheet of the Federal Reserve grew by hundreds of billions of dollars in support of the financial system. The federal government took a series of measures to shore up the economy and the markets. The Troubled Asset Relief Program ("TARP") was aimed at providing over $700 billion in government funds to the banking system in the form of equity investments. The federal government spent billions bailing out a number of prominent financial institutions, including AIG, Citigroup, and Bank of America. The government also bailed out other industries, most notably the auto industry. In 2009, President Obama signed into law his $787 billion economic stimulus, which included significant tax cuts and government spending aimed at creating jobs and turning around the economy.

The spillover of the financial crisis to the economy has been ongoing.

According to the National Bureau of Economic Research ("NBER"), the economy slipped into a recession in the 4th quarter of 2007. The NBER has indicated that the recession ended in the 2nd quarter of 2009. Nonetheless, the recovery of the economy has lagged the recoveries from previous recessions. Since the 2nd quarter of 2009, economic growth has only been 2.4% per year, and just 1.8% and 1.5% in the first two quarters of 2012. Furthermore, the muted economic recovery in the U.S. has been hindered by global economic concerns, especially the continuing fiscal and monetary issues in Europe and the slowing economic growth in China. As a result, the U.S. is still saddled with relatively high unemployment, large government budget deficits, continued housing market issues, and uncertainty about future economic growth.

In summary, the Federal Reserve and the U.S. government have taken extraordinary actions and committed great sums of money to rescue the economy, certain industries, and the capital markets. But the economy is still on an uncertain path.

Q. PLEASE PROVIDE ADDITIONAL INFORMATION ON THE ACTIONS OF THE GOVERNMENT AND THEIR IMPACT ON U. S. CAPITAL COSTS.

A. The yields on United States Treasury securities have declined to levels not seen since the 1950s. The yields on Treasury securities decreased significantly at the onset of the financial crisis and have remained at very low levels. The

decline in interest rates reflects several factors, including: (1) the "flight to quality" in the credit markets as investors sought out low risk investments during the financial crisis; (2) the very aggressive monetary actions of the Federal Reserve, which were aimed at restoring liquidity and faith in the financial system as well as maintaining low interest rates to boost economic growth; and (3) the continuing slow recovery from the recession.

The credit market for corporate and utility debt experienced higher rates due to the credit crisis. The short-term credit markets were initially hit with credit issues, leading to the demise of several large financial institutions. The primary indicator of the short-term credit market is the 3-month London Interbank Offered Rate ("LIBOR"). LIBOR peaked in the third quarter of 2008 at 4.75%. It has since declined to below 0.5% as the short-term credit markets opened up and U.S. Treasury rates have remained low. The long-term corporate credit markets tightened up during the financial crisis, but have improved significantly since 2009. Interest rates on utility and corporate debt have declined to historically low levels. These low rates reflect the weak economy, as the Federal Reserve has significantly scaled back its aggressive monetary policy actions.

Panel A of page 1 of Exhibit JRW-3 provides the yields on A, BBB+, and BBB rated public utility bonds. These yields peaked in November 2008 and have since declined by nearly 400 basis points. For example, the yields on 'A' rated utility bonds, which peaked at about 7.75% in November of 2008, have declined to 3.75% as of September, 2012. Panel B of Exhibit

JRW-3 provides the yield spreads on A, BBB+, and BBB rated public utility bonds relative to Treasury bonds. These yield spreads increased dramatically in the third quarter of 2008 during the peak of the financial crisis and have decreased significantly since that time. For example, the yield spreads between 30-year U.S. Treasury bonds and 'A' rated utility bonds peaked at over 3.50% in November of 2008, declined to 1.0% in the summer of 2012, and have since increased to about 1.25%.

In sum, while the economy continues to face significant problems, the actions of the government and Federal Reserve had a large effect on the credit markets. The capital costs for utilities, as measured by the yields on 30-year utility bonds, have declined to below pre-financial crisis levels.

Q. ARE INTEREST RATES LIKELY LOW FOR SOME TIME?

A. Yes. On September 13, 2012, the Federal Reserve released its policy statement relating to Quantitative Easing III ("QE3"). In the statement, the Federal Reserve announced the following:[1]

> To support a stronger economic recovery and to help ensure that inflation, over time, is at the rate most consistent with its dual mandate, the Committee agreed today to increase policy accommodation by purchasing additional agency mortgage-backed securities at a pace of $40 billion per month. The Committee also will continue through the end of the year its program to extend the average maturity of its holdings of securities as announced in June, and it is maintaining its existing policy of reinvesting principal payments from its holdings of agency debt and agency mortgage-backed securities in agency mortgage-backed securities. These actions, which together will increase the Committee's holdings of longer-term securities by about $85 billion each month through the end of the year, should put downward pressure on longer-

[1] Board of Governors of the Federal Reserve System, "Statement Regarding Transactions in Agency Mortgage-Backed Securities and Treasury Securities," September 13, 2012.

term interest rates, support mortgage markets, and help to make broader financial conditions more accommodative.

The Federal Reserve also indicated that it intends to keep the target rate for the federal funds rate between 0 to ¼ percent until at least through mid-2015. These monetary policy actions of the Federal Reserve, coupled with the slow economic growth, high unemployment, low inflation in the U.S., should keep interest rates and capital costs low for several years. These elements that should keep interest rates low in the U.S. are buffeted by the economic and political problems in Europe, as the U.S. is viewed as a safe haven for investment capital around the world.

The new result is that interest rates and capital costs should remain low for U.S. businesses for several years.

Q. PLEASE DISCUSS THE RECENT PERFORMANCE OF UTILITY STOCKS.

A. Utility stocks have performed quite well during the recent period of uncertainty. Page 2 of Exhibit JRW-3 graphs the performance of the Dow Jones Utility Index versus the S&P 500 over the past year. When the S&P 500 declined by over 10% in early August of 2011, utility stocks declined by much less. As the S&P 500 recovered in the fourth quarter of 2011, utility stocks continued to increase in value as well. During 2012, the S&P 500 performed better than the stocks of utilities when the markets were going up, and utility stocks outperformed the S&P 500 in down markets.

Overall, utility stocks have proven to be safe havens in volatile markets since utility stocks have low risk relative to the overall stock market. Utility stocks did not decline as much as the overall market in the market decline of the third quarter of 2011 and second quarter of 2012, and they did not increase in value as much as the overall market in the recovery of the stock market in the first and third quarters of 2012. The low relative volatility and risk of utility stocks is reflected in their low betas.

Q. OVERALL, WHAT DOES YOUR REVIEW OF THE CAPITAL MARKET CONDITIONS INDICATE ABOUT THE EQUITY COST RATE FOR UTILITIES TODAY.

A. The market data suggests that capital costs for utilities are at historically low levels. As shown on page 1 of Exhibit JRW-3, the yield on long-term 'A' rated utility bonds is only 3.75%. In addition, utility stocks have proven to be steady performers over the past year relative to the overall market. As such, equity cost rates for utilities are at relative low levels. As demonstrated later in my testimony, this observation is supported by the DCF and CAPM data for gas companies.

III. PROXY GROUP SELECTION

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

A. To develop a fair rate of return recommendation for KGS, I have evaluated the return requirements of investors on the common stock of a proxy group of publicly-held gas distribution companies ("Gas Proxy Group").

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

A. My Gas Proxy Group (proxy group) consists of eight natural gas distribution companies. These companies meet the following selection criteria: (1) listed as a Natural Gas Distribution, Transmission, and/or Integrated Gas Companies in *AUS Utility Reports*; (2) listed as a Natural Gas Utility in the Standard Edition of the *Value Line Investment Survey*; and (3) an investment grade bond rating by Moody's and Standard & Poor's. As shown on page 1 of Exhibit JRW-4, the companies meeting these criteria include AGL Resources, Atmos Energy Corporation, Laclede Group, Northwest Natural Gas Company, Piedmont Natural Gas Company, South Jersey Industries, Southwest Gas, and WGL Holdings. The only companies that met these criteria and were not included in the group were New Jersey Resources and UGI. These companies were excluded due to their low percentage of revenues from regulated gas operations. Summary financial statistics for the proxy group are listed on page 1 of Exhibit JRW-4.[2] The median operating revenues and net plant for the Gas Proxy Group are $1,650.M and $2,680.6M, respectively. The group receives 63% of revenues from regulated gas operations, has an 'A2/A3' Moody's bond rating and an

[2] In my testimony, I present financial results using both mean and medians as measures of central tendency. However, due to outliers, I have used the median as a measure of central tendency.

'A/A-' bond rating from Standard & Poor's, a current common equity ratio of 49.8%, and an earned return on common equity of 9.2%.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

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

A. The Company's proposed capital structure as recommended by Mr. Fairchild is shown in Panel A of page 1 of Exhibit JRW-5. The Company is requesting a capital structure consisting of 41.15% long-term debt and 58.85% common equity. This is ONEOK's capital structure, since KGS is an operating division of ONEOK and has no independent capital structure.

Q. PLEASE DISCUSS THE CAPITAL STRUCTURE OF ONEOK.

A. The capitalization for ONEOK is complicated by its position as the general partner of ONEOK Partners. Panel B of page 1 of Exhibit JRW-5 shows the capital structure ratios of ONEOK, Inc. and subsidiaries as of March 31, 2012. The consolidated capital structure includes 4.19% short-term debt, 52.13% long-term debt, and 43.69% common equity. This consolidated capital structure is significant because, according to Standard & Poor's, OKEOK's bond ratings reflect the consolidated capital structure of ONEOK:[3]

> The ratings reflect the consolidated credit quality of Tulsa, Okla.-based natural gas distributor ONEOK Inc., including that of subsidiary ONEOK Partners L.P. (BBB/Stable/A-2). Key credit strengths include

[3] Standard & Poor's Credit Report for ONEOK, Inc. June 27, 2012, p.1.

> the company's regulated natural gas distribution and natural gas pipeline segments that provide stable cash flow; favorably priced hedges that partly mitigate commodity price risk at ONEOK Partners; and above-average asset and geographic diversity that provides operational flexibility and organic growth opportunities. Somewhat tempering these strengths are a large, multiyear capital spending program at ONEOK Partners; a challenging operating environment at ONEOK's energy services segment; and commodity price risk at ONEOK Partners.

The above statement also indicates that the business risks of ONEOK Partners, including the capital spending and commodity price risk, are a significant factor in the bond ratings of ONEOK.

Q. PLEASE REVIEW THE AVERAGE CAPITAL STRUCTURE RATIOS FOR THE GAS PROXY GROUP.

A. Panel C of page 1 of Exhibit JRW-5 provides the average quarterly capitalization ratios for the companies in the Gas Proxy Group for the past year. Page 2 of Exhibit JRW-5 provides the supporting individual company data. The average of the quarterly capitalization data for the proxy group is 12.04% short-term debt, 36.33% long-term debt, 0.17% preferred stock, and 51.46% common equity.

Q. PLEASE DESCRIBE YOUR RECOMMENDED CAPITAL STRUCTURE FOR KGS.

A. The proposed capital structure for KGS, which is the unconsolidated capitalization of ONEOK, has a higher common equity ratio than the Gas Proxy Group. In addition, the Gas Proxy Group has a higher common equity ratio than the consolidated capitalization of ONEOK.

Page 3 of Exhibit JRW-5 provides a slide from a presentation made by ONEOK at the Tuohy Brothers Annual Energy Conference, August 7, 2012. In the presentation, the company provides debt/equity capitalization ratios for the years 2007 through 2012. The Company also indicates that its goal is a 50% debt and 50% equity capitalization. Given this goal, I will use a 50% debt and a 50% equity capital structure.

Q. WHAT LONG-TERM DEBT COST RATE ARE YOU USING FOR KGS?

A. I will use the Company's proposed debt cost rate of 5.33%.

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 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:[4]

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

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

> 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 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:[5]

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

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

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

To assess the relationship by industry, as suggested above, I have performed a regression study between estimated return on equity and market-to-book ratios using natural gas distribution, electric utility and water utility companies. I used all companies in these three industries that are covered by *Value Line* and have estimated return on equity and market-to-book ratio data. The results are presented in Panels A-C of Exhibit JRW-6. The average R-squares for the electric, gas, and water companies are 0.65, 0.60, and 0.92, respectively.[6] 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 long-term 'A' rated public utility bonds. These yields peaked in the early 2000s at over 8.0%, declined to about 5.0% in 2005, and rose to 6.0% in 2006 and 2007. They stayed in that 6.0% range until the third quarter of 2008 when they spiked to almost 7.5%. They have since retreated and are now below 4.0%.

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

Page 2 of Exhibit JRW-7 provides the dividend yields for the Gas Proxy Group over the past decade. The dividend yields for the Gas Proxy Group generally declined over the decade until 2007 to 3.75%. They increased to above 4.0% in 2008 and 2009 in response to the financial crisis, but declined in 2010 and 2011 as the markets have recovered.

Average earned returns on common equity and market-to-book ratios for the group are on page 3 of Exhibit JRW-7. The average earned returns on common equity for the Gas Proxy Group increased from the 10.0% range in 2000 to 11.50% in 2006. The earned ROEs have declined gradually since 2006, and were below 10.0% in 2011. The average market-to-book ratios for the group increased over the decade and peaked in 2007 at 1.85X. They have since declined and were at 1.60X as of 2011.

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 UTILITIES 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 annually by Aswath Damodoran of New York University.[7] The study shows that the investment risk of utilities is very low. The average beta for electric, water, and gas utility companies are 0.73, 0.66, and 0.66, respectively. In fact, the gas distribution industry is the lowest risk industry as ranked by beta of the 100 industries covered by *Value Line*. These are well below the *Value Line*

[7] *Available* at http://www.stern.nyu.edu/~adamodar.

average of 1.15. As such, the cost of equity for gas utility companies is 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 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 August 2012. For the DCF dividend yields for the group, I am using the median of the six month and August 2012 dividend yields. The table below shows these dividend yields.

	6-Month Average Dividend Yield	August 2012 Dividend Yield	DCF Dividend Yield
Gas Proxy Group	**3.8%**	**3.9%**	**3.9%**

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.[8]

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

[8] *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).

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?

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 Gas Proxy Group. I 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 utilized the average EPS growth rate forecasts of Wall Street analysts as provided by Yahoo, Reuters and Zack's. 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 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 investors and are 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). 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.

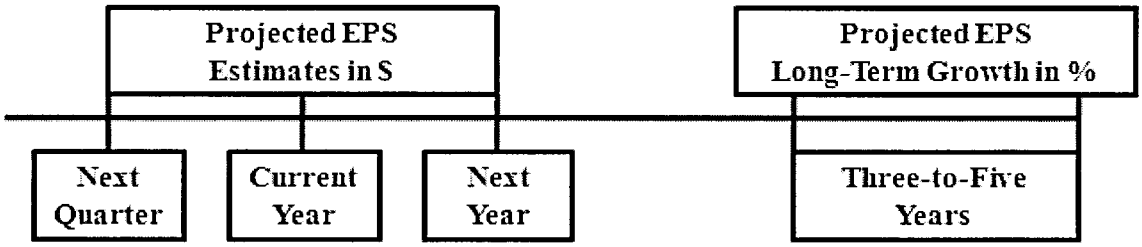
Q. PLEASE DISCUSS THE SERVICES THAT PROVDE ANALYSTS' EPS FORECASTS.

A. Analysts' EPS forecasts for companies are collected and published by a number of different investment information services, including Institutional Brokers Estimate System ("I/B/E/S"), Bloomberg, FactSet, Zacks, First Call and Reuters, among others. Thompson Reuters publishes analysts' EPS forecasts under different product names, including I/B/E/S, First Call, and Reuters. Bloomberg, FactSet, and Zacks publish their own set of analysts' EPS forecasts for companies. These services do not reveal: (1) the analysts who are solicited for forecasts; or (2) the actual analysts who actually provide the EPS forecasts that are used in the compilations published by the services. I/B/E/S, Bloomberg, FactSet, and First Call are fee-based services. These services usually provide

detailed reports and other data in addition to analysts' EPS forecasts. Thompson Reuters and Zacks do provide limited EPS forecasts data free-of-charge on the internet. Yahoo finance (http://finance.yahoo.com) lists Thompson Reuters as the source of its summary EPS forecasts. The Reuters website (www.reuters.com) also publishes EPS forecasts from Thompson Reuters, but with more detail. Zacks (www.zacks.com) publishes its summary forecasts on its website. Zack's estimates are also available on other websites, such as msn.money (http://money.msn.com).

Q. PLEASE PROVIDE AN EXAMPLE.

A. These services solicit the EPS forecasts of analysts of investment and financial service firms and publish the average EPS estimates for future quarterly and annual time periods as well as the average long-term EPS growth rate forecasts. As shown in the figure below, the projected EPS near-term estimates are usually provided for the next quarter, the current fiscal year, and the next fiscal year. The long-term projected EPS growth rate is for a three-to-five year time period.



Q. PLEASE PROVIDE AN EXAMPLE OF THESE EPS FORECASTS.

A. The following example provides the EPS forecasts compiled by Reuters for AGL Resources (stock symbol "GAS").

Consensus Earnings Estimates
AGL Resources
www.reuters.com
August 30, 2012

	# of Estimates	Mean	High	Low
Earnings (per share)				
Quarter Ending Sep-12	7	0.22	0.38	0.13
Quarter Ending Dec-12	6	1.01	1.14	0.92
Year Ending Dec-12	8	2.66	2.75	2.54
Year Ending Dec-13	8	2.99	3.10	2.72
LT Growth Rate (%)	3	5.03	7.00	4.00

These figures can be interpreted as follows. The top line shows that seven analysts have provided EPS estimates for the quarter ending September 30, 2012. The mean, high and low estimates are $0.22, $0.38, and $0.13, respectively. The second line shows the quarterly EPS estimates for the quarter ending December 31, 2012. Lines three and four show the annual EPS estimates for the fiscal years ending December 2012 and December 2013. The quarterly and annual EPS forecasts in lines 1-3 are expressed in dollars and cents. As in the GAS case shown here, it is common for more analysts to provide estimates of annual EPS as opposed to quarterly EPS. The bottom line

shows the projected long-term EPS growth rate which is expressed as a percent. For GAS, three analysts have provided long-term EPS growth rate forecasts, again which represents three- to five-year forecasts, with mean, high and low growth rates of 5.03%, 7.00%, and 4.00%.

Q. WHICH OF THESE EPS FORECASTS IS USED IN DEVELOPING A DCF GROWTH RATE?

A. The DCF growth rate is the long-term projected growth rate in EPS, DPS, and BVPS. Therefore, in developing an equity cost rate using the DCF model, the projected long-term growth rate is the projection used in the DCF model.

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, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, a new study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve

random walk forecasts of future earnings.[9] Employing data over a twenty year period, these authors demonstrate that using the most recent year's EPS figure to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. In the authors' opinion, these results indicate that that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes. Finally, and most significantly, it is well-known that the long-term EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This has been demonstrated in a number of academic studies over the years. This issue is discussed at length in Appendix B of this testimony. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate. On this issue, a study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of almost 3.0 percentage points.[10]

Q. IS IT YOUR OPINION THAT STOCK PRICES REFLECT THE UPWARD BIAS IN THE EPS GROWTH RATE FORECASTS?

A. Yes, I do believe that investors are well aware of the bias in analysts' EPS growth rate forecasts, and therefore, stock prices reflect the upward bias.

[9] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

[10] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research,* 45(5), 983–1015.

Q. HOW DOES THAT AFFECT THE USE OF THESE FORECASTS IN A DCF EQUITY COST RATE STUDY?

A. According to the DCF model, the equity cost rate is a function of the dividend yield and expected growth rate. Since stock prices reflect the bias, it would affect the dividend yield. In addition, the DCF growth rate needs to be adjusted downward from the projected EPS growth rate to reflect the upward bias.

Q. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE GAS PROXY GROUP AS PROVIDED BY *VALUE LINE.*

A. Page 3 of Exhibit JRW-10 provides the 5- and 10- year historical growth rates for the companies in the group, as published in the *Value Line Investment Survey.* The historical growth measures in EPS, DPS, and BVPS for the Gas Proxy Group, as measured by the medians, range from 2.5% to 6.3%, with an average of 4.5%.

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 Gas Proxy Group are shown on page 4 of Exhibit JRW-10. As above, due to the presence of outliers, the medians are used in the analysis. For the group, the medians range from 2.5% to 4.8%, with an average of 3.8%.

Also provided on page 4 of Exhibit JRW-10 is prospective sustainable growth for the proxy group as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is significant in a primary driver of long-run earnings growth. For the Gas Proxy Group, the median prospective sustainable growth rate is 5.1%.

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

A. Yahoo, Zacks, and Reuters collect, summarize, and publish Wall Street analysts' long-term 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 4.6%.[11]

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. A growth rate of 4.5% is indicated by the historical growth and 5.1% by sustainable growth. Analysts' projections suggest an EPS growth rate of 4.6% and *Value Line*'s projected growth for EPS, DPS, BVPS

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

is 3.8%. The average of historical and projected growth rates, as well as sustainable and projected growth rates, is 4.5%. Given these figures, an expected DCF growth rate of 4.5% is reasonable 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.

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

	Dividend Yield	1 + ½ Growth Adjustment	DCF Growth Rate	Equity Cost Rate
Gas Proxy Group	**3.9%**	**1.0225**	**4.5%**	**8.50%**

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 represented by 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.

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

A. The yield on 30-year Treasury bonds has been in the 2.6% to 4.0% range over the past year. These rates are currently at the lower end of this range. Given the recent range of yields, and the prospect of higher rates in the future, I will use 4.0%, 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.

Several 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 0.65.

Q. PLEASE DISCUSS THE ALTERNATIVE 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.[12] 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.[13]

In addition, there are a number of surveys of financial professionals regarding the equity risk premium. There have been several published surveys of academics on the equity risk premium. *CFO Magazine* conducts a quarterly survey of CFOs which includes questions regarding their views on the current expected returns on stocks and bonds. Usually over 500 CFOs participate in the survey.[14] Questions regarding expected stock and bond returns are also

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

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

[14] *See,* www.cfosurvey.org.

included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters which is published as the *Survey of Professional Forecasters*.[15] This survey of professional economists has been published for almost 50 years. In addition, Pablo Fernandez conducts occasional surveys of financial analysts and companies regarding the equity risk premiums they use in their investment and financial decision-making.

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 premium.[16] Derrig and Orr's study evaluated the various approaches to estimating equity risk premiums as well as the issues with the alternative approaches and summarized 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

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[15] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters,* (February 12, 2012). 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.

[16] *See* 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); Zhiyi Song, "The Equity Risk Premium: An Annotated Bibliography," CFA Institute, (2007).

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, as well as other more recent studies of the equity risk premium. 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 in Appendix B. The Building Blocks approach is a hybrid approach employing elements of both historical and *ex ante* models.

Q. PLEASE DISCUSS PAGE 5 OF EXHIBIT JRW-11.

A. Page 5 of 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, analysts, companies and academics, and (4) the Building Block approaches to the equity risk premium. There are results reported for over thirty studies, and the median equity risk premium is 5.06%.

Q. PLEASE HIGHLIGHT THE RESULTS OF THE MORE RECENT RISK PREMIUM STUDIES AND SURVEYS?

A. The studies cited on page 5 of Exhibit JRW-11 include all equity risk premium studies and surveys I could identify that were published over the past decade and that provided an equity risk premium estimate. Most of these studies were published prior to the financial crisis of the past two years. In addition, some of these studies were published in the early 2000s at the market peak. It should be noted that many of these studies (as indicated) used data over long periods of time (as long as fifty years of data) and so they were not estimating an equity risk premium as of a point in time (e.g., the year 2001). To assess the effect of the earlier studies on the equity risk premium, on page 6 of Exhibit JRW-11, I have reconstructed page 5 of Exhibit JRW-11, but I have eliminated all studies dated before January 2, 2010. The median for this subset of studies is 4.96%.

Q. GIVEN THESE RESULTS, WHAT EQUITY RISK PREMIUM ARE YOU USING IN YOUR CAPM?

A. I use the median equity risk premium for the 2010-12 studies and surveys, which is 5.0%.

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

A. Yes. In the June 2012 CFO survey conducted by *CFO Magazine* and Duke University, the expected 10-year equity risk premium was 4.5%.

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

A. Yes. The financial forecasters in the previously referenced Federal Reserve Bank of Philadelphia survey project both stock and bond returns. As shown on Panels D and E of page 8 of Exhibit JRW-11, the mean long-term expected stock and bond returns were 6.80% and 4.0%, respectively. This provides an *ex ante* equity risk premium of 2.80%.

Q. IS YOUR *EX ANTE* EQUITY RISK PREMIUM CONSISTENT WITH THE EQUITY RISK PREMIUMS OF FINANCIAL ANALYSTS AND COMPANIES?

A. Yes. Pablo Fernandez recently published the results of a 2012 survey of financial analysts and companies. This survey included over 6,000 responses. The median equity risk premium employed by U.S. analysts and companies was 5.0% and 5.5%.

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.[17]

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

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

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

	Risk-Free Rate	Beta	Equity Risk Premium	Equity Cost Rate
Gas Proxy Group	**4.00%**	**0.65**	**5.0%**	**7.3%**

These results are summarized on page 1 of Exhibit JRW-11.

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

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 are indicated below:

	DCF	CAPM
Gas Proxy Group	**8.5%**	**7.3%**

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 Gas Proxy Group is in the 7.3% to 8.5% range. However, since I give greater weight to the DCF model, I am using the upper end of the range as the equity cost rate. Therefore, I conclude that the appropriate equity cost rate for the Gas Proxy Group is 8.5%.

Q. PLEASE INDICATE WHY AN 8.50% RETURN IS APPROPRIATE FOR KGS AT THIS TIME.

A. There are several reasons why an 8.50% return on equity is appropriate for the Company in this case. First, as shown on in Exhibit JRW-8, the gas distribution industry is *Value Line*'s lowest risk industry as measured by beta. As such, this industry has the lowest cost of equity capital in the U.S. according to the CAPM. Second, as shown in Exhibit JRW-3, capital costs for utilities, as indicated by long-term bond yields, have declined to

historically low levels. Third, while the financial markets have recovered significantly over the past two years, the economy has not. The economic times are still viewed as being difficult, with greater than eight percent unemployment. As a result, interest rates and inflation are at relatively low levels, and hence the expected returns on financial assets – from savings accounts to Treasury bills to common stocks – are low. Therefore, in my opinion, an 8.5% return is appropriate for a regulated gas company.

VII. CRITIQUE OF KGS'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE KGS' OVERALL RATE OF RETURN RECOMMENDATION.

A. KGS's rate of return recommendation is provided by Mr. Bruce H. Fairchild. KGS's rate of return recommendation is summarized on page 1 of Exhibit JRW-12. The Company's recommended capital structure consists of 41.15% long-term debt and 58.85% common equity. KGS has employed a long-term debt cost rate of 5.33% and an equity cost rate of 10.75%.

Q. WHAT ISSUES DO YOU HAVE WITH THE COMPANY'S COST OF CAPITAL POSITION?

A. The primary areas of disagreement in measuring KGS cost of capital are: (1) the appropriate capital structure for KGS; (2) the expected DCF growth rate, including Mr. Fairchild's elimination of low DCF equity cost rates as well as his use of the projected growth rates of Wall Street analysts to measure

expected DCF growth; (3) the base interest rate as well as the measurement and magnitude of the equity risk premium used in CAPM and RPM approaches; (4) the validity of the CE equity cost rate approach; and (5) the Company's adjustments for size and flotation costs. I have previously discussed the capital structure issue. The other issues are addressed below.

Q. BEFORE ADRESSING THESE AREAS OF DISAGREEMENT, PLEASE DISCUSS MR. FAIRCHILD'S GAS GROUP.

A. Mr. Fairchild's gas utility group includes the same companies in my Gas Proxy Group with the exception of New Jersey Resources. I have excluded New Jersey Resources since the company only receives 26% of its revenues from regulated gas operations. Nonetheless, I do not believe that the differences in the compositions of the Gas Proxy Group and Mr. Fairchild's gas LDC group are significant.

A. DCF Approach

Q. PLEASE SUMMARIZE MR. FAIRCHILD'S DCF ESTIMATES.

A. On pages 22-29 of his testimony and in Exhibit Nos. BHF-3-BHF-6, Mr. Fairchild develops an equity cost rate by applying a DCF model to his proxy group. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth rate. For the DCF growth rate, Mr. Fairchild reviews the following growth rate measures – the projected EPS

growth of Wall Street analysts as compiled by I/B/E/S (4.2%), and Zack's (4.7%), *Value Line's* projected EPS projected growth rate (5.0%), a *Value Line* retention growth measure that is computed as the sum of internal ("br") and external ("sv") growth (6.0%), historical EPS growth from *Value Line* of 5-years (6.4%) and 10-years (5.8%), historical growth rate measure. Based on this review, and after eliminating certain "clearly unreliable indicators of growth," Mr. Fairchild concludes that the appropriate growth rate for the group is in the 5.50% to 6.50% range.

Mr. Fairchild's DCF results for his gas group are summarized in Panel B of page 1 of Exhibit JRW-13. The average of the DCF results is 9.30% using a DCF growth rate of 5.50% and 10.30% using a DCF growth rate of 6.50%.

Q. PLEASE EXPRESS YOUR CONCERNS WITH MR. FAIRCHILD'S DCF STUDY.

A. I have three issues with Mr. Fairchild's DCF equity cost rate: (1) the subjective labeling and elimination of certain growth rate indicators; (2) the excessive reliance on the EPS growth rate forecasts of Wall Street analysts and *Value Line* as a DCF growth rate; and (3) his DCF growth rate indicators do not support his DCF growth rate range of 5.50% to 6.50%.

1. Labeling and Elimination of DCF Growth Rate Indicators

Q. PLEASE ADDRESS MR. FAIRCHILD'S ELIMINATION OF CERTAIN DCF GROWTH RATE INDICATORS.

A. Mr. Fairchild's has labeled certain DCF growth rate measures as being "clearly unreliable indicators of growth" and did not consider these growth rate measures. In CURB-160, Mr. Fairchild was asked to identify and justify his elimination of certain growth rate indicators. His response is provided in Panel A of page 2 of Exhibit JRW-13. Mr. Fairchild indicates while he did not employ any screening criteria, he did eliminate two growth rate indicators because, in his opinion, they produced low DCF equity cost rates. He has only eliminated low DCF growth rate indicators and has not also eliminated any high DCF growth rate indicators. By eliminating only low outliers and not also eliminating high outliers, Mr. Fairchild biases his DCF equity cost rate study and reports a higher DCF equity cost rate than the data indicate.

Mr. Fairchild also makes reference to two industry growth rate figures of 7.68% and 9.0% which are associated with Yahoo Finance and Zacks. In CURB-161, Mr. Fairchild was asked to identify the companies associated with these growth rates. His response is provided in Panel B of page 2 of Exhibit JRW-13. Mr. Fairchild indicates he does not know. Since the identity of the companies associated with these growth rate figures is not known, and it is not known if these companies are in his proxy group, Mr. Fairchild cannot use these figures to establish a DCF growth rate for his proxy group.

2. Reliance of Wall Street Analysts' EPS Growth Rate Forecasts

Q. PLEASE DISCUSS MR. FAIRCHILD'S RELIANCE ON THE PROJECTED GROWTH RATES OF WALL STREET ANALYSTS AND *VALUE LINE.*

A. It seems highly unlikely that investors today would rely excessively on the EPS growth rate forecasts of Wall Street analysts and ignore other growth rate measure in arriving at their expected growth rates for equity investments. As I previously indicated, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Hence, consideration must be given to other indicators of growth, including historical prospective dividend growth, internal growth, as well as projected earnings growth. In addition, a recent study by Lacina, Lee, and Xu (2011) has shown that analysts' long-term earnings growth rate forecasts are not more accurate at forecasting future earnings than naïve random walk forecasts of future earnings.[18] As such, the weight give to analysts' projected EPS growth rate should be limited. And finally, and most significantly, it is well-known that the long-term 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 produces an overstated equity cost rate. A recent study by Easton and Sommers (2007) found that optimism in analysts' growth rate forecasts leads to an upward bias in estimates of the cost of equity capital of

[18] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

almost 3.0 percentage points.[19] These issues are addressed in more detail in Appendix B.

3. Mr. Fairchild's Data does not Support his 5.50% to 6.50% Range

Q. DO MR. FAIRCHILD'S DCF GROWTH RATE INDICATORS SUPPORT HIS 5.50% TO 6.50% DCF GROWTH RATE RANGE?

A. No. Page 3 of Exhibit JRW-13 provides the growth rate indicators reviewed by Mr. Fairchild. I have provided both the mean and median figures, since the medians can provide a better measure of central tendency if outliers exist. The mean and median figures for the fifteen growth rate measures are in the 4.6% to 4.8% range. Hence, Mr. Fairchild's DCF growth rate indicators support a growth rate range of 4.50% to 5.0% and not 5.50% to 6.50%.

Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. FAIRCHILD'S DCF EQUITY RATE STUDY.

A. Mr. Fairchild's DCF equity cost rates are overstated because: (1) he has arbitrarily eliminated low-end DCF results for his gas group; (2) has relied excessively on the upwardly biased EPS growth rate forecasts of Wall Street analysts and *Value Line*; and (3) his 5.50% to 6.50% DCF growth rate range is not supported by the fifteen growth rate indicators he claims to have reviewed.

[19] Easton, P., & Sommers, G. (2007). Effect of analysts' optimism on estimates of the expected rate of return implied by earnings forecasts. *Journal of Accounting Research*, 45(5), 983–1015.

B. CAPM Approach

Q. PLEASE DISCUSS MR. FAIRCHILD'S CAPM.

A. On pages 29 to 34 and Exhibit No. BHF-7, Mr. Fairchild applies the CAPM method to his gas group. He calculates a CAPM equity cost rate using (1) a prospective risk-free bond rate of 3.28%, (2) a beta of 0.67, (3) two market risk premiums (a) a historical market risk premium of 6.60% and (b) a projected market risk premium of 10.22%; and (4) a size premium of 1.74 for the gas group. His results are summarized in Panel C of page 1 of Exhibit JRW-13.

Q. WHAT ARE THE ERRORS IN MR. FAIRCHILD'S CAPM ANALYSIS?

A. There are numerous flaws with Mr. Fairchild's CAPM analysis: (1) the risk-free interest rate of 3.28%; (2) the a historical market risk premium of 6.60% and especially the projected market risk premium of 10.22%; and (4) the inclusion of a size premium of 1.74%. The issues are reviewed below.

1. Risk-Free Interest Rate

Q. PLEASE DISCUSS THE RISK-FREE RATE OF INTEREST IN MR. FAIRCHILD'S CAPM.

A. Mr. Fairchild has use a risk-free rate of interest of 3.28% in his CAPM analyses. The rate is above current market yields. As of September 14, 2012, the actual yield on 30-year Treasury bonds is 3.07%.

2. Equity or Market Risk Premium

Q. PLEASE REVIEW THE ERRORS IN MR. FAIRCHILD'S EQUITY OR MARKET RISK PREMIUM USED IN HIS CAPM APPROACH.

A. The primary problem with Mr. Fairchild's CAPM analysis is the size of the market or equity risk premium. Mr. Fairchild develops a historical market risk premium of 6.60% and a projected market risk premium of 10.22%. The historical market risk premium is computed as the difference in the between the arithmetic mean stock and bond income returns over the 1926-2011 period. The projected market risk premium is calculated by computing a DCF expected market return using the S&P 500 and subtracting the risk-free interest rate. The primary error with Mr. Fairchild's equity risk premium is that both the Ibbotson historical returns and Mr. Fairchild's projected market returns are poor measures of expected market risk premiums.

Q. PLEASE ADDRESS THE PROBLEMS WITH MR. FAIRCHILD'S HISTORICAL RISK PREMIUM.

A. Mr. Fairchild computes a historical risk premium of 6.60% based on the difference between the arithmetic mean stock and bond income returns over the 1926-2011 period. The errors associated with computing an expected equity risk premium using historical stock and bond returns are addressed at length earlier and in Appendix D of this testimony. In short, there are a

myriad of empirical problems in this approach, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the "Peso Problem"), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing).

Q. PLEASE CRITIQUE MR. FAIRCHILD'S PROSPECTIVE EQUITY OR MARKET RISK PREMIUM OF 10.22%.

A. Mr. Fairchild prospective market risk premium is calculated using an expected stock market return of 13.50%. This is computed as applying the DCF model to the S&P 500 and utilizing a dividend yield of 2.50% and an expected DCF growth rate of 11.0%. The primary error is that the expected DCF growth rate is the projected 5-year EPS growth rate for the companies in the S&P 500 as reported by *Value Line*, I/B/E/S, and Zack's. As explained below, this produces an overstated expected market return and equity risk premium.

Q. WHAT EVIDENCE CAN YOU PROVIDE THAT THE MR FAIRCHILD'S S&P 500 GROWTH RATE IS ERRONEOUS?

A. Mr. Fairchild's expected S&P 500 growth rate of 11.0% represents the forecasted 5-year EPS growth rates of Wall Street analysts. The error with this approach is that the EPS growth rate forecasts of Wall Street securities analysts are overly optimistic and upwardly biased. This is detailed at length

in Appendix B. Further, a long-term growth rate of 11.0% is inconsistent with historical economic and earnings growth in the U.S. The long-term economic and earnings growth rate in the U.S. has only been in the 5% to 7% range. I have performed a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are provided on page 1 of Exhibit JRW-14, and a summary is given in the table below.

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

Nominal GDP	**6.80%**
S&P 500 Stock Price	**6.21%**
S&P 500 EPS	**6.98%**
S&P 500 DPS	**5.18%**
Average	**6.29%**

The results are presented graphically on page 2 of Exhibit JRW-14. In sum, the historical long-run growth rates for GDP, S&P EPS, and S&P DPS are in the 5% to 7% range. By comparison, Mr. Fairchild's long-run growth rate projection of 11.0% is vastly overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by almost 100% in the future and (2) maintain that growth indefinitely in an economy that is expected to grow at about one-half of his projected growth rates.

Q. DO MORE RECENT DATA SUGGEST THAT THE U.S. ECONOMY GROWTH IS FASTER OR SLOWER THAN THE LONG-TERM DATA?

A. The more recent trends suggest lower future economic growth than the long-term historical GDP growth. The historical GDP growth rates for 10-, 20-, 30-, 40- and 50- years are presented in Panel A of page 3 of Exhibit JRW-14. These figures clearly suggest that nominal GDP growth in recent decades has slowed and that a figure in the range of 4.0% to 5.0% is more appropriate today for the U.S. economy. These figures indicate that Mr. Fairchild long-term growth EPS growth rate of 11.0% is even more inflated.

Q. WHAT LEVEL OF GDP GROWTH IS FORECASTED BY ECONOMISTS AND VARIOUS GOVERNMENT AGENCIES?

A. There are several forecasts of annual GDP growth that are available from economists and government agencies. These are listed in Panel B of page 3 of Exhibit JRW-14. The mean 10-year nominal GDP growth forecast (as of February 2012) by economists in the recent *Survey of Professional Forecasters* is 4.9%. The Energy Information Administration (EIA), in its projections used in preparing *Annual Energy Outlook,* forecasts long-term GDP growth of 4.8% for the period 2009-2035. The Congressional Budget Office, in its forecasts for the period 2012 to 2022, projects a nominal GDP growth rate of 4.8%. As such, projections of nominal GDP growth provide additional

evidence that Mr. Fairchild's long-term EPS growth rate of 11.0% is highly overstated.

Q. PLEASE HIGHLIGHT THE RECENT RESEARCH ON THE LINK BETWEEN ECONOMIC AND EARNINGS GROWTH AND EQUITY RETURNS.

A. Brad Cornell of the California Institute of Technology recently published a study on GDP growth, earnings growth, and equity returns. He finds that long-term EPS growth in the U.S. is directly related GDP growth, with GDP growth providing an upward limit on EPS growth. In addition, he finds that long-term stock returns are determined by long-term earnings growth. He concludes with the following observations:[20]

> The long-run performance of equity investments is fundamentally linked to growth in earnings. Earnings growth, in turn, depends on growth in real GDP. This article demonstrates that both theoretical research and empirical research in development economics suggest relatively strict limits on future growth. In particular, real GDP growth in excess of 3 percent in the long run is highly unlikely in the developed world. In light of ongoing dilution in earnings per share, this finding implies that investors should anticipate real returns on U.S. common stocks to average no more than about 4–5 percent in real terms.

Given current inflation in the 3% range, the results imply nominal expected stock market returns in the 7% to 8% range. As such, Mr. Fairchild's projected earnings growth rates and implied expected stock market returns and equity risk premiums are not indicative of the realities of the U.S. economy

[20] Bradford Cornell, "Economic Growth and Equity Investing," *Financial Analysts Journal* (January- February, 2010), p. 63.

and stock market. Consequently, his CAPM equity cost rates are vastly overstated and should be rejected.

Q. PLEASE PROVIDE A SUMMARY ASSESSMENT OF MR. FAIRCHILD'S PROJECTED EQUITY RISK PREMIUM DERIVED FROM EXPECTED MARKET RETURNS.

A. Mr. Fairchild's market risk premium derived from his DCF application to the S&P 500 is inflated due to errors and bias in his study. Investment banks, consulting firms, and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions. On this issue, the opinions of CFOs and financial forecasters are especially relevant. CFOs deal with capital markets on an ongoing basis since they must continually assess and evaluate capital costs for their companies. They are well aware of the historical stock and bond return studies of Ibbotson. The CFOs in the June 2012 *CFO Magazine* – Duke University Survey of over almost 500 CFOs shows an expected return on the S&P 500 of 6.3% over the next ten years. In addition, the financial forecasters in the February 2012 Federal Reserve Bank of Philadelphia survey expect an annual market return of 6.8% over the next ten years. As such, with a more realistic equity or market risk premium, the appropriate equity cost rate for a public utility should be in the 8.0% to 9.0% range and not in the 11.0% to 12.0% range.

3. Size Adjustment

Q. PLEASE DISCUSS MR. FAIRCHILD'S SIZE ADJUSTMENT.

A. Mr. Fairchild includes a size adjustment of 1.74% in his CAPM approach for the size of the companies in the gas group. This adjustment is based on the historical stock market returns studies as performed by Morningstar (formerly Ibbotson Associates). As discussed in Appendix D, there are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are survivorship bias (only successful companies survive – poor companies do not survive) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for risk adjustment to account for the size of the Company.

In addition, 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.[21] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions, and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments. In addition, public utilities must gain

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

approval from government entities for common financial transactions such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in which performance is reviewed by state commissions and other interested parties. Overall, in terms of regulation, government oversight, performance review, accounting standards, and information disclosure, utilities are much different than industrials, which could account for the lack of a size premium.

Q. PLEASE DISCUSS RECENT RESEARCH ON THE SIZE PREMIUM IN ESTIMATING THE EQUITY COST RATE.

A. As noted, there are errors in using historical market returns to compute risk premiums. With respect to the small firm premium, Richard Roll (1983) found that one-half of the historical return premium for small companies disappears once biases are eliminated and historical returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historical small firm returns.[22]

In a more recent paper, Ching-Chih Lu (2009) estimated the size premium over the long-run. Lu acknowledges that many studies have demonstrated that smaller companies have historically earned higher stock

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

market returns. However, Lu highlights that these studies rebalance the size portfolios on an annual basis. This means that at the end of each year the stocks are sorted based on size, split into deciles, and the returns are computed over the next year for each stock decile. This annual rebalancing creates the problem. Using a size premium in estimating a CAPM equity cost rate requires that a firm carry the extra size premium in its discount factor for an extended period of time, not just for one year, which is the presumption with annual rebalancing. Through an analysis of small firm stock returns for longer time periods (and without annual rebalancing), Lu finds that the size premium disappears within two years. Lu's conclusion with respect to the size premium is:[23]

> However, an analysis of the evolution of the size premium will show that it is inappropriate to attach a fixed amount of premium to the cost of equity of a firm simply because of its current market capitalization. For a small stock portfolio which does not rebalance since the day it was constructed, its annual return and the size premium are all declining over years instead of staying at a relatively stable level. This confirms that a small firm should not be expected to have a higher size premium going forward sheerly because it is small now.

C. Risk Premium Approach

Q. PLEASE DISCUSS MR. FAIRCHILD'S RISK PREMIUM (RP) APPROACH.

[23] Ching-Chih Lu, "The Size Premium in the Long Run," 2009 Working Paper, SSRN abstract no. 1368705.

A. At pages 34-36 of his testimony and in Exhibit No. BHF-9, Mr. Fairchild estimates an equity cost rate of 9.63% using the RP approach. These results are summarized in Panel D of page 1 of Exhibit JRW-13. Mr. Fairchild's RP approach is based on the historical relationship between the yields on Moody's A-rated public utility bond yields and authorized returns on equity ("ROEs") for natural gas utilities. Mr. Fairchild used a base interest rate of 4.48% and risk premium of 5.15%. This approach overstates the equity cost rate for the Company in two ways. First, the base yield is in excess of investor return requirements. This is because the base yield, the rate on A-rated utility bonds, is subject to credit risk. With credit risk, the expected return on the bond is below the yield-to-maturity. Hence, the yield-to-maturity of the bond is above the expected return. Second, and more importantly, the risk premium is inflated as a measure of investor's required risk premium since the utilities have been selling at a market-to-book ratios in excess of 1.0 for many years. This indicates that the authorized rates of return have been greater than the return that investors require. Therefore, the risk premium produced from the study is overstated as a measure of investor return requirements and produced an inflated equity cost rate.

D. Comparable Earnings Approach

Q. PLEASE DISCUSS MR. FAIRCHILD'S COMPARABLE EARNINGS ANALYSIS.

A. On pages 36-37 of his testimony and Exhibit BHF-10, Mr. Fairchild estimates equity cost rates ranging from of 11.63% for the gas utility and combination utility groups using an approach he calls the Comparable Earnings ("CE") approach. These results are summarized in Panel E of page 1 of Exhibit JRW-13. His methodology simply involves using the expected ROE for the companies in the proxy groups as estimated by *Value Line*. This approach is fundamentally flawed for several reasons. First, these ROE results include the profits associated with the unregulated operations of the utility proxy group. As previously noted, the unregulated operations are significant for some of the companies in the gas utility group. More importantly, since Mr. Fairchild has not evaluated the market-to-book ratios for these companies, he cannot indicate whether the past and projected returns on common equity are above or below investors' requirements. These returns on common equity are excessive if the market-to-book ratios for these companies are above 1.0.

E. Flotation Cost Adjustment

Q. PLEASE DISCUSS MR. FAIRCHILD'S ADJUSTMENT FOR FLOTATION COSTS.

A. Mr. Fairchild claims that an upward adjustment to the equity cost rate is warranted for flotation costs. This adjustment factor is erroneous for several reasons. First, the Company has not identified any actual flotation costs for the Company. Therefore, the Company is requesting annual revenues in the

form of a higher return on equity for flotation costs that have not been identified. Second, it is commonly argued that a flotation cost adjustment (such as that used by the Company) is necessary to prevent the dilution of the existing shareholders. In this case, a flotation cost adjustment is justified by reference to bonds and the manner in which issuance costs are recovered by including the amortization of bond flotation costs in annual financing costs. However, this is incorrect for several reasons:

(1) If an equity flotation cost adjustment is similar to a debt flotation cost adjustment, the fact that the market-to-book ratios for gas utility companies are over 1.5X actually suggests that there should be a flotation cost reduction (and not increase) to the equity cost rate. This is because when (a) a bond is issued at a price in excess of face or book value, and (b) the difference between market price and the book value is greater than the flotation or issuance costs, the cost of that debt is lower than the coupon rate of the debt. The amount by which market values of gas utility companies are in excess of book values is much greater than flotation costs. Hence, if common stock flotation costs were exactly like bond flotation costs, and one was making an explicit flotation cost adjustment to the cost of common equity, the adjustment would be downward;

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

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

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

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas the Company believes that it should be compensated for these transactions costs, they have not accounted for other market transaction costs in determining a cost of equity for the Company. Most notably, brokerage fees that investors pay when they buy shares in the open market are another market transaction cost. Brokerage fees increase the effective stock price paid by

investors to buy shares. If the Company had included these brokerage fees or transaction costs in their DCF analysis, the higher effective stock prices paid for stocks would lead to lower dividend yields and equity cost rates. This would result in a downward adjustment to their DCF equity cost rate.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

VERIFICATION

COMMONWEALTH OF PENNSYLVANIA)

COUNTY OF CENTRE) ss:

Dr. J. Randall Woolridge, being duly sworn upon his oath, deposes and states that he is a consultant for the Citizens' Utility Ratepayer Board, that he has read the above and foregoing document, and, upon information and belief, states that the matters therein appearing are true and correct.

Dr. J. Randall Woolridge

SUBSCRIBED AND SWORN to before me this 11th day of September, 2012.

Notary Public

My Commission expires: 11-10-2015

NOTARIAL SEAL
RONALD E FLEBOTTE
Notary Public
STATE COLLEGE BORO., CENTRE COUNTY
My Commission Expires Nov 10, 2015

APPENDIX A

Educational Background, Research, and Related Business Experience

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. He has taught Finance courses including corporation finance, commercial and investment banking, and investments at the undergraduate, graduate, and executive MBA levels.

Professor Woolridge's research has centered on empirical issues in corporation finance and financial markets. 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*, *Barron's*, *Wall Street Journal*, *Business Week*, *Investors' Business Daily*, *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's *Morning Call.*

Professor Woolridge's 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 textbook entitled *Basic Principles of Finance* (Kendall Hunt, 2011). Dr. Woolridge is a founder and a managing director of www.valuepro.net - a stock valuation website.

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

Over the past twenty-five years Dr. Woolridge has prepared testimony and/or provided consultation services in regulatory rate cases in the rate of return area in following states: Alaska, Arizona, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Indiana, Kansas, Kentucky, Massachusetts, Missouri, Nebraska, New Jersey, New York, Ohio, Oklahoma, Pennsylvania, South Carolina, Texas, Utah, Vermont, Washington, and Washington, D.C. He has also prepared testimony which was submitted to the Federal Energy Regulatory Commission.

APPENDIX B

Research on Analysts' Long-Term
EPS Growth Rate Forecasts

Exhibit JRW-B1
Pages 1-6

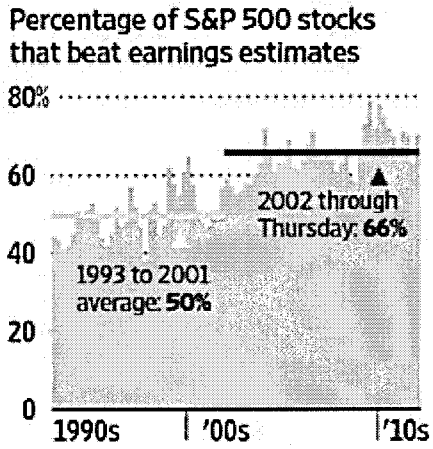
Appendix B
The Research on Analysts' Long-Term EPS Growth Rate Forecasts

Most of the attention given the accuracy of analysts' EPS forecasts comes from media coverage of company's quarterly earnings announcements. When companies announced earnings beat Wall Street's EPS estimates ("a positive surprise"), their stock prices usually go up. When a company's EPS figure misses or is below Wall Street's forecasted EPS ("A negative surprise"), their stock price usually declines, sometimes precipitously so. Wall Street's estimate is the consensus forecast for quarterly EPS made by analysts who follow the stock as of the announcement date. And so Wall Street's estimate is the consensus EPS made in the days leading up to the EPS announcement.

In recent years, it has become more common for companies to beat Wall Street's quarterly EPS estimate. A recent *Wall Street Journal* article summarized the results for the first quarter of 2012: "While this "positive surprise ratio" of 70% is above the 20 year average of 58% and also higher than last quarter's tally, it is just middling since the current bull market began in 2009. In the past decade, the ratio only dipped below 60% during the financial crisis. Look before 2002, though, and 70% would have been literally off the chart. From 1993 through 2001, about half of companies had positive surprises.[1] Figure 1 below provides the record for companies beating Wall Street's EPS estimate on a quarterly basis over the past twenty years.

[1] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

Figure 1
Percent of Companies Beating Wall Street's Quarterly Estimates



Source: BBH Equity Strategy Research

A. RESEARCH ON THE ACCURACY OF ANALYSTS' NEAR-TERM EPS ESTIMATES

There is a long history of studies that evaluate how well analysts forecast near-term EPS estimates and long-term EPS growth rates. Most of these studies have evaluated the accuracy of earnings forecasts for the current quarter or year. Many of the early studies indicated that analysts make overly optimistic EPS earnings forecasts for quarter-to-quarter EPS (Stickel (1990); Brown (1997); Chopra (1998)).[2] More recent studies have shown that the optimistic bias tends to be larger for longer-term forecasts and smaller for forecasts made nearer to the EPS announcement date. Richardson, Teoh, and Wysocki (2004) report that the upward bias in earnings growth rates declines in the quarters leading up to the

[2] S. Stickel, "Predicting Individual Analyst Earnings Forecasts," *Journal of Accounting Research*, Vol. 28, 409-417, 1990. Brown, L.D., "Analyst Forecasting Errors: Additional Evidence," *Financial Analysts Journal*, Vol. 53, 81-88, 1997, and Chopra, V.K., "Why So Much Error in Analysts' Earnings Forecasts?" *Financial Analysts Journal*, Vol. 54, 30-37 (1998).

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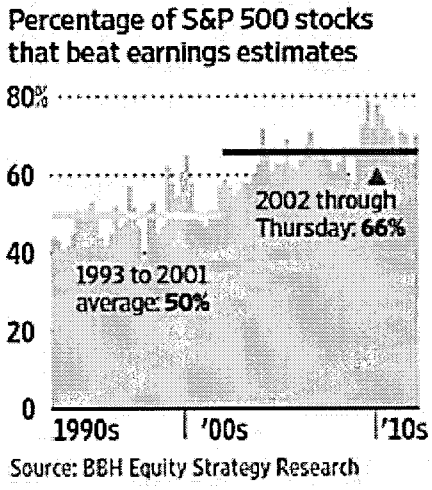

Source: B&H Equity Strategy Research

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[2] S. Stickel, "Predicting Individual Analyst Earnings Forecasts," *Journal of Accounting Research*, Vol. 28, 409-417, 1990. Brown, L.D., "Analyst Forecasting Errors: Additional Evidence," *Financial Analysts Journal*, Vol. 53, 81-88, 1997, and Chopra, V.K., "Why So Much Error in Analysts' Earnings Forecasts?" *Financial Analysts Journal*, Vol. 54, 30-37 (1998).

earnings announcement date.[3] They call this result the "walk-down to beatable analyst forecasts." They hypothesize that the walk-down might be driven by the "earning-guidance game," in which analysts give optimistic forecasts at the start of a fiscal year, then revise their estimates downwards until the firm can beat the forecasts at the earnings announcement date.

However, two regulatory developments over the past decade have potentially impacted analysts' EPS growth rate estimates. First, Regulation Fair Disclosure ("Reg FD") was introduced by the Securities and Exchange Commission ("SEC") in October of 2000. Reg FD prohibits private communication between analysts and management so as to level the information playing field in the markets. With Reg FD, analysts are less dependent on gaining access to management to obtain information and therefore, are not as likely to make optimistic forecasts to gain access to management. Second, the conflict of interest within investment firms with investment banking and analyst 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.

[3] S. Richardson, S. Teoh, and P. Wysocki, "The Walk-Down to Beatable Analyst Forecasts: The Role of Equity Issuance and Insider Trading Incentives," *Contemporary Accounting Research*, pp. 885–924, (2004).

The previously cited *Wall Street Journal* article acknowledged the impact of the new regulatory rules in explaining the recent results:[4] " What changed? One potential reason is the tightening of rules governing analyst contacts with management. Analysts now must rely on publicly available guidance or, gasp, figure things out by themselves. That puts companies, with an incentive to set the bar low so that earnings are received positively, in the driver's seat. While that makes managers look good short-term, there is no lasting benefit for buy-and-hold investors."

These comments on the impact of regulatory developments on the accuracy of short-term EPS estimates was addressed in a study by Hovakimian and Saenyasiri (2010).[5] The authors investigate analysts' forecasts of annual earnings for the following time periods: (1) the time prior to Reg FD (1984-2000); (2) the time period after Reg FD but prior to GARS (2000-2002);[6] and (3) the time period after GARS (2002-2006). For the pre-Reg FD period, Hovakimian and Saenyasiri find that analysts generally make overly optimistic forecasts of annual earnings. The forecast bias is higher for early forecasts and steadily declines in the months leading up to the earnings announcement. The results are similar for the time period after Reg FD but prior to GARS. However, the bias is lower in the later forecasts (the forecasts made just prior to the announcement).

[4] Spencer Jakab, "Earnings Surprises Lose Punch," *Wall Street Journal* (May 7, 2012), p. C1.

[5] A. Hovakimian and E. Saenyasiri, "Conflicts of Interest and Analysts Behavior: Evidence from Recent Changes in Regulation," *Financial Analysts* Journal (July-August, 2010), pp. 96-107.

[6] Whereas the GARS settlement was signed in 2003, rules addressing analysts' conflict of interest by separating the research and investment banking activities of analysts went into effect with the passage of NYSE and NASD rules in July of 2002.

For the time period after GARS, the average forecasts declined significantly, but a positive bias remains. In sum, Hovakimian and Saenyasiri find that: (1) analysts make overly optimistic short-term forecasts of annual earnings; (2) Reg FD had no effect on this bias; and (3) GARS did result in a significant reduction in the bias, but analysts' short-term forecasts of annual earnings still have a small positive bias.

B. RESEARCH ON THE ACCURACY OF ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS

There have been very few studies regarding the accuracy of analysts' long-term EPS growth rate forecasts. Cragg and Malkiel (1968) studied analysts' long-term EPS growth rate forecasts made in 1962 and 1963 by five brokerage houses for 185 firms. They concluded that analysts' long-term earnings growth forecasts are on the whole no more accurate than naive forecasts based on past earnings growth. Harris (1999) evaluated the accuracy of analysts' long-term EPS forecasts over the 1982-1997 time-period using a sample of 7,002 firm-year observations.[7] He concluded the following: (1) the accuracy of analysts' long-term EPS forecasts is very low; (2) a superior long-run method to forecast long-term EPS growth is to assume that all companies will have an earnings growth rate equal to historic GDP growth; and (3) analysts' long-term EPS forecasts are significantly upwardly biased, with forecasted earnings growth exceeding actual earnings growth by seven percent per annum. Subsequent studies by DeChow, P., A. Hutton, and R. Sloan (2000), and Chan, Karceski, and Lakonishok (2003) also

[7] R.D. Harris, "The Accuracy, Bias, and Efficiency of Analysts' Long Run Earnings Growth Forecasts," *Journal of Business Finance & Accounting*, pp. 725-55 (June/July 1999).

conclude that analysts' long-term EPS growth rate forecasts are overly optimistic and upwardly biased.[8] The Chan, Karceski, and Lakonishok (2003) study evaluated the accuracy of analysts' long-term EPS growth rate forecasts over the 1982-98 time period. They reported a median IBES growth forecast of 14.5%, versus a median realized five-year growth rate of about 9%. They also found the IBES forecasts of EPS beyond two years are not accurate. They concluded the following: "Over long horizons, however, there is little forecastability in earnings, and analysts' estimates tend to be overly optimistic."

Lacina, Lee, and Xu (2011) evaluated the accuracy of analysts' long-term earnings growth rate forecasts over the 1983-2003 time period.[9] The study included 27,081 firm year observations, and compared the accuracy of analysts' EPS forecasts to those produced by two naïve forecasting models: (1) a random walk model ("RW") where the long-term EPS (t+5) is simply equal to last year's EPS figure (t-1); (2) a RW model with drift ("RWGDP"), where the drift or growth rate is GDP growth for period t-1. In this model, long-term EPS (t+5) is simply equal to last year's EPS figure (t-1) times (1 + GDP growth (t-1)). The authors conclude that that using the RW model to forecast EPS in the next 3-5 years proved to be just as accurate as using the EPS estimates from analysts' long-term earnings growth rate forecasts. They find that the RWGDP model performs

[8] P. DeChow, A. Hutton, and R. Sloan, "The Relation Between Analysts' Forecasts of Long-Term Earnings Growth and Stock Price Performance Following Equity Offerings," *Contemporary Accounting Research (2000)* and K. Chan, L., Karceski, J., & Lakonishok, J., "The Level and Persistence of Growth Rates," *Journal of Finance* pp. 643–684, (2003).

[9] M. Lacina, B. Lee and Z. Xu, *Advances in Business and Management Forecasting (Vol. 8),* Kenneth D. Lawrence, Ronald K. Klimberg (ed.), Emerald Group Publishing Limited, pp.77-101

better than the pure RW model, and that both models perform as well as analysts in forecasting long-term EPS. They also discover an optimistic bias in analysts' long-term EPS forecasts. In the authors' opinion, these results indicate that analysts' long-term earnings growth rate forecasts should be used with caution as inputs for valuation and cost of capital purposes.

C. ISSUES REGARDING THE SUPERIORITY OF ANALYSTS' EPS FORECASTS OVER HISTORIC AND TIME-SERIES ESTIMATES OF LONG-TERM EPS GROWTH

As highlighted by the classic study by Brown and Rozeff (1976) and the other studies that followed, analysts' forecasts of quarterly earnings estimates are superior to the estimates derived from historic and time-series analyses.[10] This is often attributed to the information and timing advantage that analysts have over historic and time-series analyses. These studies relate to analysts' forecasts of quarterly and/or annual forecasts, and not to long-term EPS growth rate forecasts. The previously cited studies by Harris (1999), Chan, Karceski, and Lakonishok (2003), and Lacina, Lee, and Xu (2011) all conclude that analysts' forecasts are no better than time-series models and historic growth rates in forecasting long-term EPS. Harris (1999) and Lacina, Lee, and Xu (2011) concluded that historic GDP growth was superior to analysts' forecasts for long run earnings growth. These overall results are similar to the findings by Bradshaw, Drake, Myers, and Myers (2009) that discovered that time-series estimates of annual earnings are

[10] L. Brown and M. Rozeff, "The Superiority of Analyst Forecasts as Measures of Expectations: Evidence from Earnings," *The Journal of Finance* 33 (1): pp. 1-16 (1976).

more accurate over longer horizons than analysts' forecasts of earnings. As the authors state, "These findings suggest an incomplete and misleading generalization about the superiority of analysts' forecasts over even simple time-series-based earnings forecasts."[11]

D. STUDY OF THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES

To evaluate the accuracy of analysts' EPS forecasts, I have compared actual 3-5 year EPS growth rates with forecasted EPS growth rates on a quarterly basis over the past 20 years for all companies covered by the I/B/E/S data base. In Panel A of page 1 of Exhibit JRW-B1, I show the average analysts' forecasted 3-5 year EPS growth rate with the average actual 3-5 year EPS growth rate for the past twenty years.

The following example shows how the results can be interpreted. For the 3-5 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 5.6 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

[11] M. Bradshaw, M. Drake, J. Myers, and L. Myers, "A Re-examination of Analysts' Superiority Over Time-Series Forecasts," Workings paper, (1999), http://ssrn.com/abstract=1528987.

observation period are 143.06% and 75.08%, respectively. The forecasting 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 Panel A of page 1 of Exhibit JRW-B1, the quarters with negative forecast errors were for the 3-5 year periods following earnings declines associated with the 1991 and 2001 economic recessions in the U.S. Thus, there is evidence of a persistent upward bias in long-term EPS growth forecasts.

The average 3-5 year EPS growth rate projections for all companies provided in the I/B/E/S database on a quarterly basis from 1988 to 2008 are shown in Panel B of page 1 of Exhibit JRW-B1. In this graph, no comparison to actual EPS growth rates is made, and hence, there is no follow-up period. Therefore, since companies are not lost from the sample 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 increased to the 18.0% range in 2006, and have since decreased to about 14.0%.

The upward bias in analysts' long-term EPS growth rate forecasts appears to be known in the markets. Page 2 of Exhibit JRW-B1 provides an article published in the *Wall Street Journal*, dated March 21, 2008, that discusses the upward bias in analysts' EPS growth rate forecasts.[12] In addition, a recent *Bloomberg Businessweek*

[12] Andrew Edwards, "Study Suggests Bias in Analysts' Rosy Forecasts," *Wall Street Journal* (March 21, 2008), p.

article also highlighted the upward bias in analysts' EPS forecasts, citing a study by McKinsey Associates. This article is provided on pages 3 and 4 of Exhibit JRW-B1. The article concludes with the following:[13]

The bottom line: *Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.*

E. REGULATORY DEVELOPMENTS AND THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES FORECASTS

Whereas Hovakimian and Saenyasiri evaluated the impact of regulations on analysts' short-term EPS estimates, there is little research on the impact of Reg FD and GARS on the long-term EPS forecasts of Wall Street analysts. My study with Patrick Cusatis did find that the long-term EPS growth rate forecasts of analysts did not decline significantly and have continued to be overly-optimistic in the post Reg FD and GARS period.[14] Analysts' long-term EPS growth rate forecasts before and after GARS are about two times the level of historic GDP growth. 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:

C6.

[13] Roben Farzad, 'For Analysts, Things are Always Looking Up,' *Bloomberg Businessweek* (June 14, 2010), pp. 39-40.

[14] P. Cusatis and J. R. Woolridge, "The Accuracy of Analysts' Long-Term EPS Growth Rate Forecasts," Working Paper, (July 2008).

> 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.[15]

These observations are echoed in a recent McKinsey study entitled "Equity Analysts: Still too Bullish" which involved a study of the accuracy on analysts long-term EPS growth rate forecasts. The authors conclude that after a decade of stricter regulation, analysts' long-term earnings forecasts continue to be excessively optimistic. They made the following observation (emphasis added): [16]

> Alas, a recently completed update of our work only reinforces this view—despite a series of rules and regulations, dating to the last decade, that were intended to improve the quality of the analysts' long-term earnings forecasts, restore investor confidence in them, and prevent conflicts of interest. For executives, many of whom go to great lengths to satisfy Wall Street's expectations in their financial reporting and long-term strategic moves, this is a cautionary tale worth remembering. This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions. When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases. So as economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts, as they did, for example, in 1988, from 1994 to 1997, and from 2003 to 2006. Moreover, analysts have been persistently overoptimistic for the past 25 years, with estimates ranging from 10 to 12

[15] 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*, p. C1, (January 27, 2003).
[16] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, "Equity Analysts, Still Too Bullish," *McKinsey on Finance*, pp. 14-17, (Spring 2010).

percent a year, compared with actual earnings growth of 6 percent. Over this time frame, actual earnings growth surpassed forecasts in only two instances, both during the earnings recovery following a recession. On average, analysts' forecasts have been almost 100 percent too high.

F. ANALYSTS' LONG-TERM EPS GROWTH RATE FORECASTS FOR UTILITY COMPANIES

To evaluate whether analysts' EPS growth rate forecasts are upwardly biased for utility companies, I conducted a study similar to the one described above using a group of electric utility and gas distribution companies. The results are shown on Panels A and B of page 5 of Exhibit JRW-B1. The projected EPS growth rates for electric utilities have been in the 4% to 6% range over the last twenty years, with the recent figures approximately 5%. As shown, the achieved EPS growth rates have been volatile and on average, below the projected growth rates. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 4.59% and 2.90%, respectively.

For gas distribution companies, the projected EPS growth rates have declined from about 6% in the 1990s to about 5% in the 2000s. The achieved EPS growth rates have been volatile. Over the entire period, the average quarterly 3-5 year projected and actual EPS growth rates are 5.15% and 4.53%, respectively.

Overall, the upward bias in EPS growth rate projections for electric utility and gas distribution companies is not as pronounced as it is for all companies. Nonetheless, the results here are consistent with the results for companies in

general -- analysts' projected EPS growth rate forecasts are upwardly-biased for utility companies.

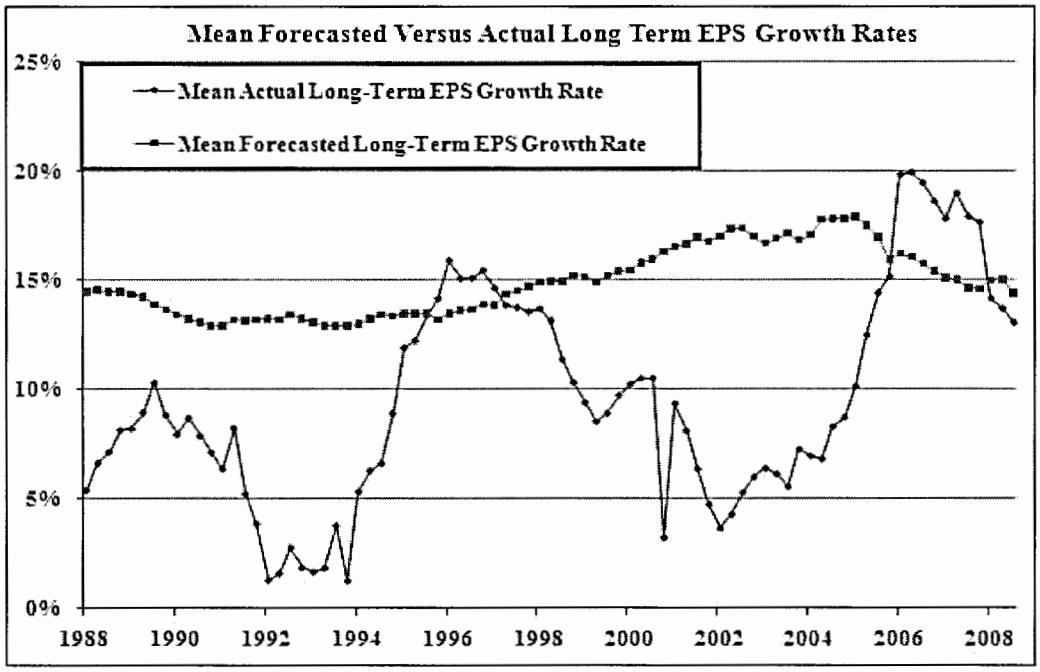
G. *VALUE LINE*'S LONG-TERM EPS GROWTH RATE FORECASTS

To assess *Value Line*'s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in Panel A of Page 6 of Exhibit JRW-B1. I initially filtered the database and found that *Value Line* has 3-5 year EPS growth rate forecasts for 2,333 firms. The average projected EPS growth rate was 14.70%. 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 43 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.

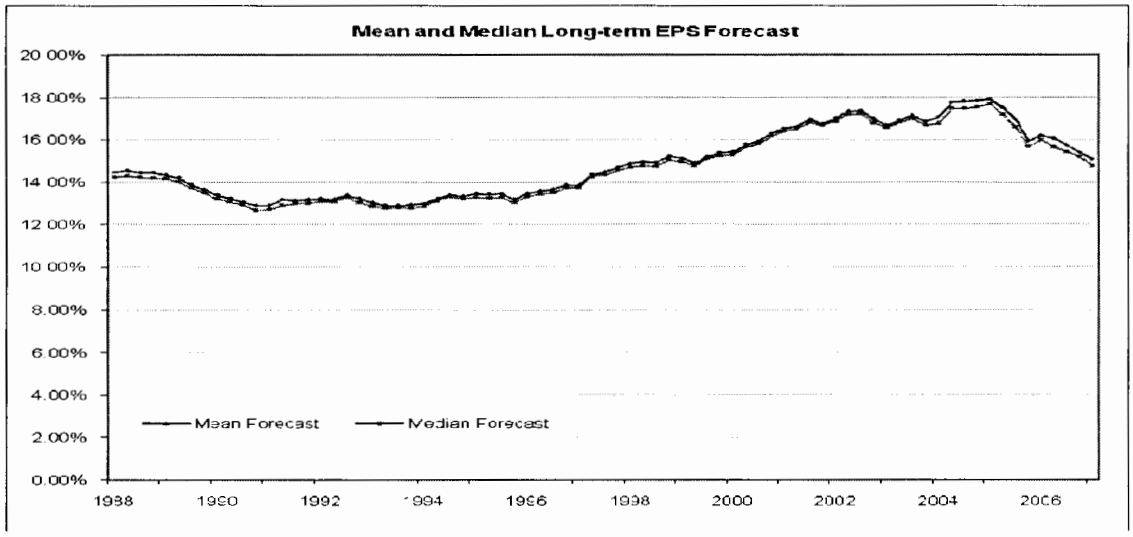
To put this figure in perspective, I screened the *Value Line* companies to see what percent of companies covered by *Value Line* had experienced negative EPS growth rates over the past five years. *Value Line* reported a five-year historic growth rate for 2,219 companies. The results are shown in Panel B of page 6 of Exhibit JRW-B1 and indicate that the average 5-year historic growth rate was 3.90%, and *Value Line* reported negative historic growth for 844 firms which represents 38.0% of these companies.

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.

Panel A
Long-Term Forecasted Versus Actual EPS Growth Rates
1988-2009



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

Markets & Finance June 10, 2010, 5:00PM EST

Bloomberg Businessweek

For Analysts, Things Are Always Looking Up

They're raising earnings estimates for U.S. companies at a record pace

By Roben Farzad

For years, the rap on Wall Street securities analysts was that they were shills, reflexively producing upbeat research on companies they cover to help their employers win investment banking business. The dynamic was well understood: Let my bank take your company public, or advise it on this acquisition, and—wink, wink—I will recommend your stock through thick or thin. After the Internet bubble burst, that was supposed to change. In April 2003 the Securities & Exchange Commission reached a settlement with 10 Wall Street firms in which they agreed, among other things, to separate research from investment banking.

Seven years on, Wall Street analysts remain a decidedly optimistic lot. Some economists look at the global economy and see troubles—the European debt crisis, persistently high unemployment worldwide, and housing woes in the U.S. Stock analysts as a group seem unfazed. Projected 2010 profit growth for companies in the Standard & Poor's 500-stock index has climbed seven percentage points this quarter, to 34 percent, data compiled by Bloomberg show. According to Sanford C. Bernstein (AB), that's the fastest pace since 1980, when the Dow Jones industrial average was quoted in the hundreds and Nancy Reagan was getting ready to order new window treatments for the Oval Office.

Among the companies analysts expect to excel: Intel (INTL) is projected to post an increase in net income of 142 percent this year. Caterpillar, a multinational that gets much of its revenue abroad, is expected to boost its net income by 47 percent this year. Analysts have also hiked their S&P 500 profit estimate for 2011 to $95.53 a share, up from $92.45 at the beginning of January, according to Bloomberg data. That would be a record, surpassing the previous high reached in 2007.

With such prospects, it's not surprising that more than half of S&P 500-listed stocks boast overall buy ratings. It is telling that the proportion has essentially held constant at both the market's October 2007 high and March 2009 low, bookends of a period that saw stocks fall by more than half. If the analysts are correct, the market would appear to be attractively priced right now. Using the $95.53 per share figure, the price-to-earnings ratio of the S&P 500 is a modest 11 as of June 9. If, however, analysts end up being too high by, say, 20 percent, the P/E would jump to almost 14.

If history is any guide, chances are good that the analysts are wrong. According to a recent McKinsey report by Marc Goedhart, Rishi Raj, and Abhishek Saxena, "Analysts have been persistently over-optimistic for 25 years," a stretch that saw them peg earnings growth at 10 percent to 12 percent a year when the actual number was ultimately 6 percent. "On average," the researchers note, "analysts' forecasts have been almost 100 percent too high," even after regulations were enacted to weed out conflicts and improve the rigor of their calculations. As the chart below shows, in most years analysts have been forced to lower their estimates after it became apparent they had set them too high.

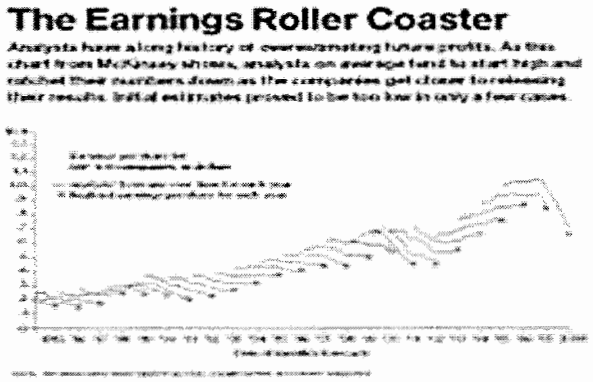
While a few analysts, like Meredith Whitney, have made their names on bearish calls, most are chronically bullish. Part of the problem is that despite all the reforms they remain too aligned with the companies they cover. "Analysts still need to get the bulk of their information from companies, which have an incentive to be over-optimistic," says Stephen Bainbridge, a professor at UCLA Law School who specializes in the securities industry. "Meanwhile, analysts don't want to threaten that ongoing access by being too negative." Bainbridge says that with the era of the overpaid, superstar analyst long over, today's job description calls for resisting the urge to be an iconoclast. "It's a matter of herd behavior," he says.

So what's a more plausible estimate of companies' earning power? Looking at factors including the strengthening dollar, which hurts exports, and higher corporate borrowing costs, David Rosenberg, chief economist at Toronto-based investment shop Gluskin Sheff + Associates, says "disappointment looms." Bernstein's Adam Parker says every 10 percent drop in the value of the euro knocks U.S. corporate earnings down by 2.5 percent to 3 percent. He sees the S&P 500 earning $86 a share next year.

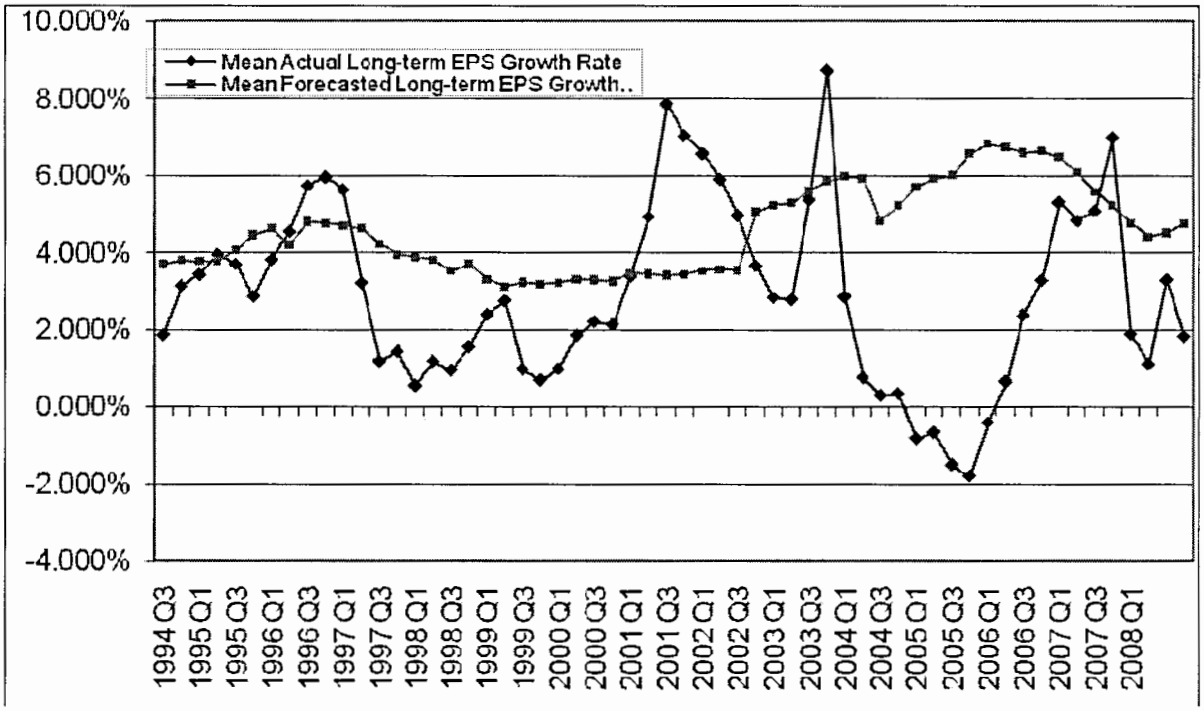
As realities hit home, "It's only natural that analysts will have to revise down their views," says Todd Salamone, senior vice-president at Schaeffer's Investment Research. The market may be making its own downward adjustment, as the S&P 500 has already fallen 14 percent from its high in April. If precedent holds, analysts are bound to curb their enthusiasm belatedly, telling us next year what we really needed to know this year.

The bottom line: *Despite reforms intended to improve Wall Street research, stock analysts seem to be promoting an overly rosy view of profit prospects.*

Bloomberg Businessweek Senior Writer Farzad covers Wall Street and international finance.

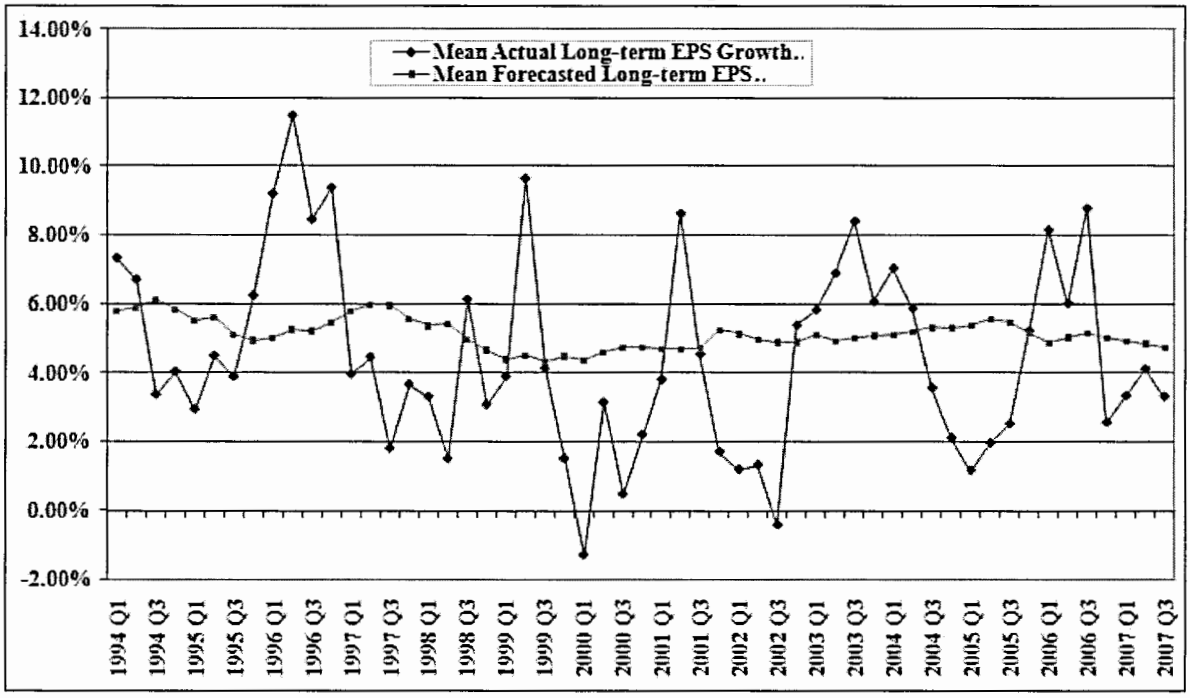


Panel A
Long-Term Forecasted Versus Actual EPS Growth Rates
Electric Utility Companies
1988-2008



Data Source: IBES

Panel B
Long-Term Forecasted Versus Actual EPS Growth Rates
Gas Distribution Companies



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
2,333 Companies	**14.70%**	**43**	**1.80%**

Value Line Investment Survey, June, 2012

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
2,219 Companies	**3.90%**	**844**	**38.00%**

Value Line Investment Survey, June, 2012

APPENDIX C

Building Blocks Equity Risk Premium

Exhibit JRW-C1
Pages 1-5

Appendix C
Building Blocks Equity Risk Premium

A. THE BUILDING BLOCKS MODEL

Ibbotson and Chen (2003) evaluate the ex post historical mean stock and bond returns in what is called the Building Blocks approach.[1] 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").[2] This is shown on page 1 of Exhibit JRW-C1. 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%).

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

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

The third column in the graph on page 2 of Exhibit JRW-C1 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. Long term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's publication entitled *Survey of Professional Forecasters*. 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 2011 survey, published on February 10, 2012, the median long-term (10-year) expected inflation rate as measured by the CPI was 2.30% (see Panel A of page 3 of Exhibit JRW-C1).

The University of Michigan's Survey Research Center surveys consumers on their short-term (one-year) inflation expectations on a monthly basis. As shown on page 4 of Exhibit JRW-C1, the current short-term expected inflation rate is 3.1%.

As a measure of expected inflation, I will use the average of the long-term (2.3%) and short-term (3.1%) inflation rate measures, or 2.7%.

D/P – As shown on page 5 of Exhibit JRW-C1, the dividend yield on the S&P 500 has fluctuated from 1.0% to almost 3.5% over the past decade. Ibbotson and Chen (2003) report that the long-term average dividend yield of the S&P 500 is 4.3%. As of August 7, 2012, the indicated S&P 500 dividend yield was 2.2%. I will use this figure in my ex ante risk premium analysis.

RG – To measure expected real growth in earnings, I use the historical real earnings growth rate S&P 500 and the expected real GDP growth rate. The S&P 500 was created in 1960 and includes 500 companies which come from ten different sectors of the economy. On page 11 of Exhibit JRW-11, real EPS growth is computed using the CPI as a measure of inflation. The real growth figure over 1960-2010 period for the S&P 500 is 2.8%.

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 5.50% of U.S. GDP.[3] Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of Professional Forecasters,* is 2.6% (see Panel B of page 8 of Exhibit JRW-11).

Given these results, I will use 2.70%, 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 5 of Exhibit JRW-C1. The run-up and eventual peak in P/Es in the year 2000 is very evident in the chart. The average P/E declined until late 2006, and then increased to higher high levels, primarily due to the decline in EPS as a result of the financial crisis and the recession. As of 6/30/12, the average P/E for the S&P 500 was 15.16, which is in line with the historic average. Since the current figure is near

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

the historic average, a PEGAIN would not be appropriate in estimating an ex ante expected stock market return.

Expected Return form Building Blocks Approach - The current 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 1 of Exhibit JRW-C1. As shown, the expected market return of 7.60% is composed of 2.70% expected inflation, 2.20% dividend yield, and 2.70% real earnings growth rate.

This expected return of 7.60% is consistent other expected return forecasts.

1. In the first quarter 2012 *Survey of Financial Forecasters*, published on February 10, 2012 by the Federal Reserve Bank of Philadelphia, the median long-term expected return on the S&P 500 was 6.8% (see Panel D of page 3 of Exhibit JRW-C1).
2. John Graham and Campbell Harvey of Duke University conduct a quarterly survey of corporate CFOs. The survey is a joint project of Duke University and *CFO Magazine.* In the June 2012 survey, the mean expected return on the S&P 500 over the next ten years was 6.3%.[4]

B. THE BUILDING BLOCKS EQUITY RISK PREMIUM

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

Appendix C
Building Blocks Equity Risk Premium

The current 30-year U.S. Treasury yield is 2.70%. This ex ante equity risk premium is simply the expected market return from the Building Blocks methodology minus this risk-free rate:

Ex Ante Equity Risk Premium = 7.60% - 2.70% = 4.90%

This is only one estimate of the equity risk premium. As shown on page 6 of Exhibit JRW-11, I am also using the results of other studies and surveys to determine an equity risk premium for my CAPM.

Exhibit JRW-C1

Decomposing Equity Market Returns
The Building Blocks Methodology

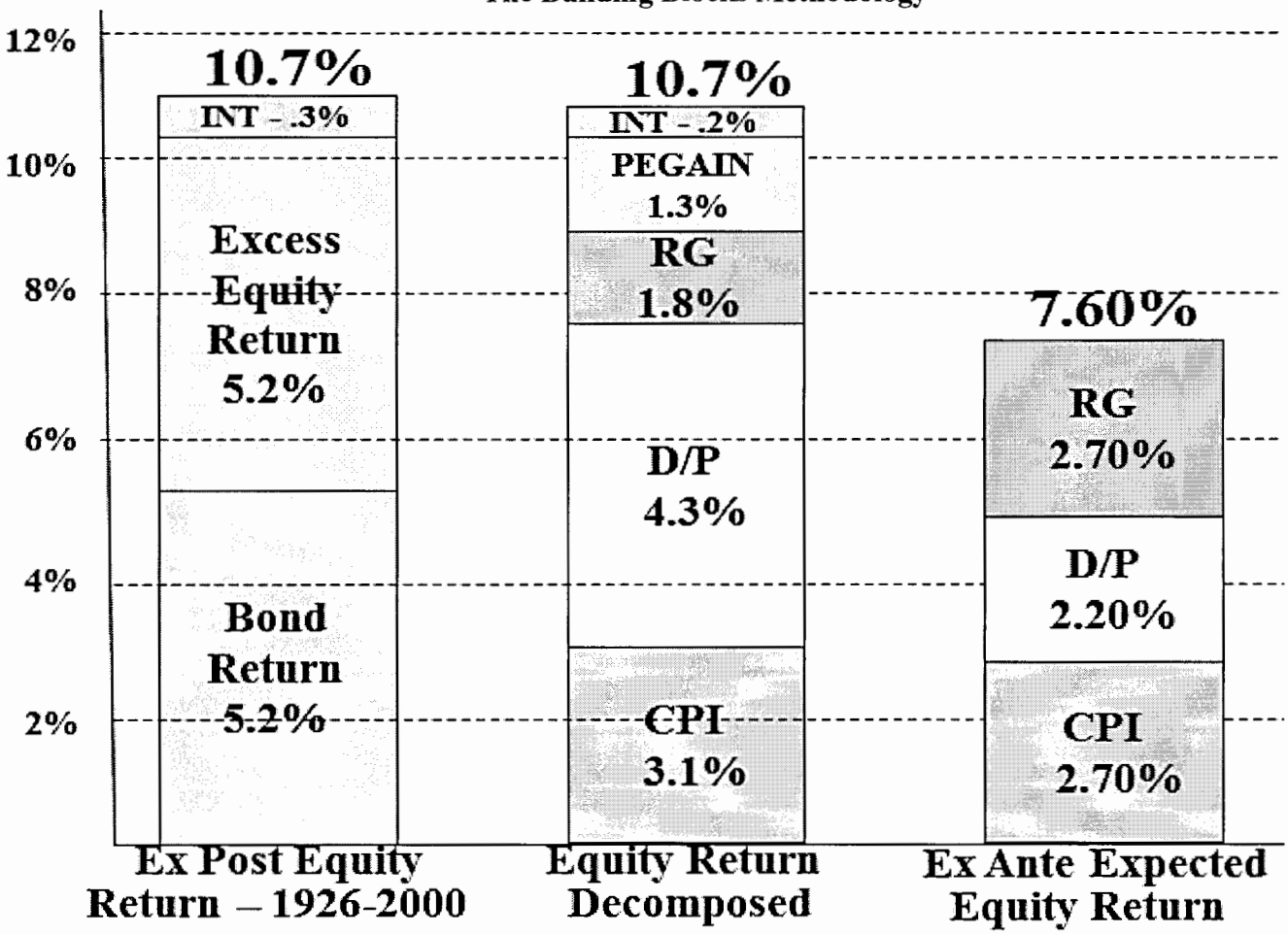


Exhibit JRW-C1

2012 Survey of Professional Forecasters
Philadelphia Federal Reserve Bank
Long-Term Forecasts

Table Seven
LONG-TERM (10 YEAR) FORECASTS

Panel A

SERIES: CPI INFLATION RATE	
STATISTIC	
MINIMUM	0.99
LOWER QUARTILE	2.10
MEDIAN	2.30
UPPER QUARTILE	2.70
MAXIMUM	6.40
MEAN	2.49
STD. DEV.	0.84
N	37
MISSING	8

Panel B

SERIES: REAL GDP GROWTH RATE	
STATISTIC	
MINIMUM	1.90
LOWER QUARTILE	2.50
MEDIAN	2.64
UPPER QUARTILE	2.90
MAXIMUM	3.75
MEAN	2.67
STD. DEV.	0.41
N	37
MISSING	8

Panel C

SERIES: PRODUCTIVITY GROWTH	
STATISTIC	
MINIMUM	1.20
LOWER QUARTILE	1.60
MEDIAN	1.85
UPPER QUARTILE	2.10
MAXIMUM	3.10
MEAN	1.93
STD. DEV.	0.45
N	26
MISSING	19

Panel D

SERIES: STOCK RETURNS (S&P 500)	
STATISTIC	
MINIMUM	4.00
LOWER QUARTILE	5.00
MEDIAN	6.80
UPPER QUARTILE	7.60
MAXIMUM	9.20
MEAN	6.30
STD. DEV.	1.54
N	19
MISSING	26

Panel E

SERIES: BOND RETURNS (10-YEAR)	
STATISTIC	
MINIMUM	-2.00
LOWER QUARTILE	3.40
MEDIAN	4.00
UPPER QUARTILE	4.50
MAXIMUM	8.40
MEAN	3.83
STD. DEV.	1.72
N	26
MISSING	19

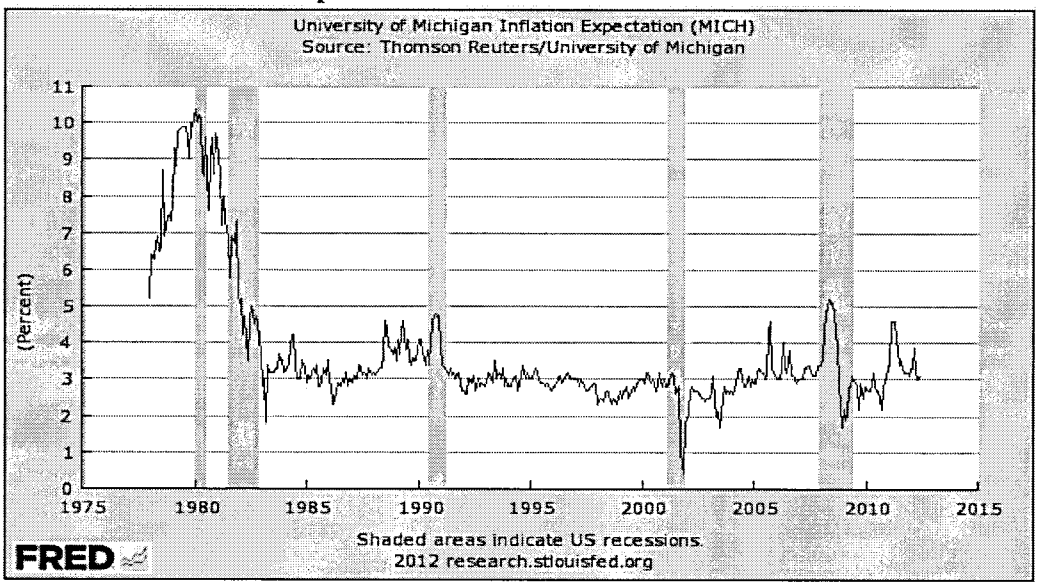
Panel F

SERIES: BILL RETURNS (3-MONTH)	
STATISTIC	
MINIMUM	-2.00
LOWER QUARTILE	2.75
MEDIAN	3.00
UPPER QUARTILE	3.31
MAXIMUM	4.75
MEAN	2.93
STD. DEV.	1.13
N	30
MISSING	13

Source: Philadelphia Federal Researve Bank, Survey of Professional Forecasters, February 10, 2012.

Exhibit JRW-C1

University of Michigan Survey Research Center
Expected Short-Term Inflation Rate

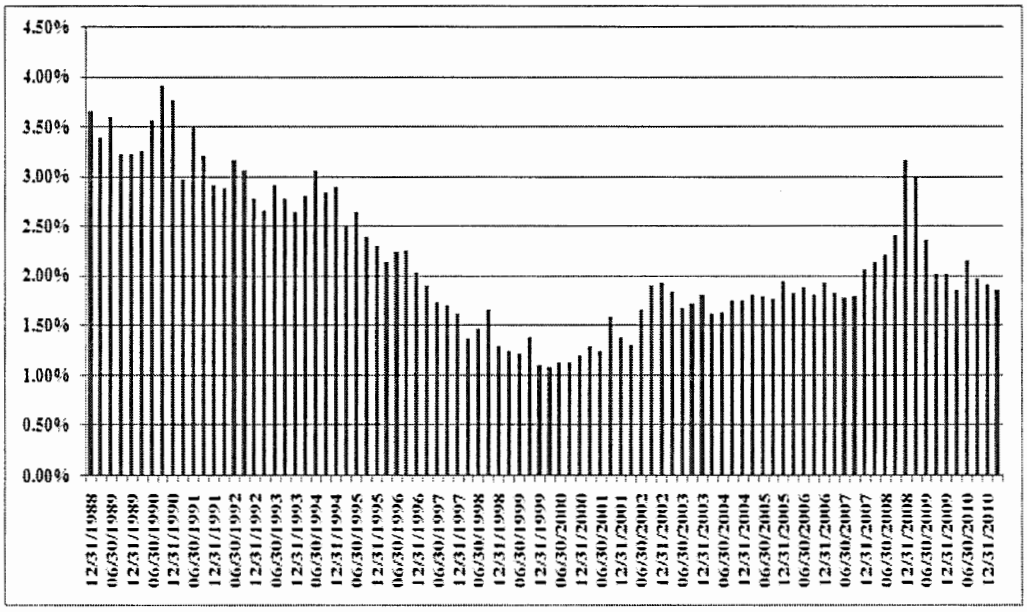


Data Source: http://research.stlouisfed.org/fred2/series/MICH?cid=98

Exhibit JRW-C1

Decomposing Equity Market Returns
The Building Blocks Methodology

S&P 500 Dividend Yield



S&P 500 P/E Ratio

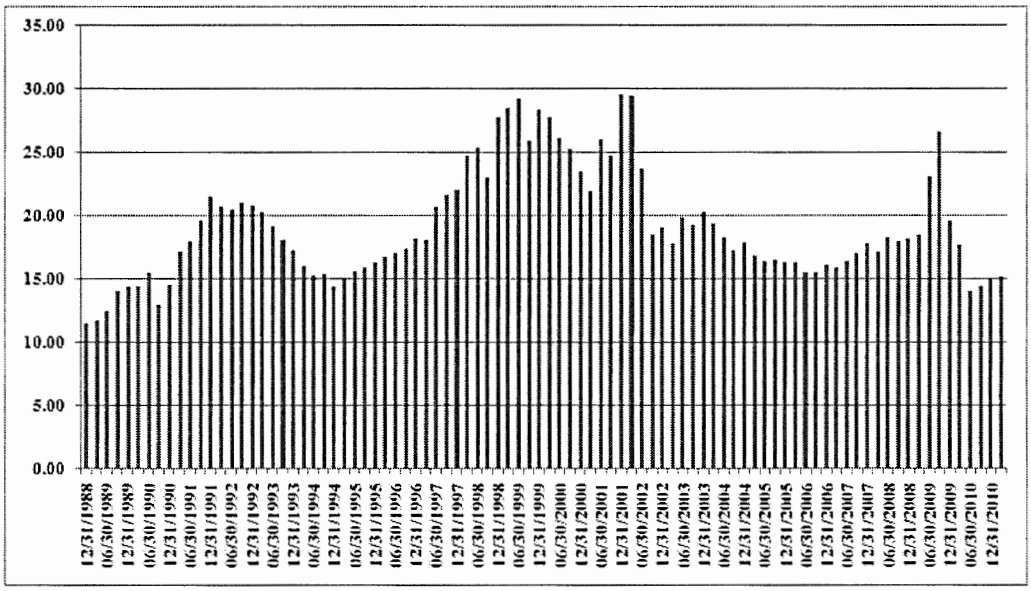


Exhibit JRW-C1

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	
2005	68.32	3.42	6.60	10.35	
2006	81.96	2.54	6.77	12.11	
2007	87.51	4.08	7.04	12.43	
2008	65.39	0.09	7.05	9.28	
2009	59.65	2.72	7.24	8.24	10-Year
2010	83.66	1.50	7.35	11.39	2.46%
2011	97.05	2.96	7.57	12.83	
Data Source: http://pages.stern.nyu.edu/~adamodar/				Real EPS Growth	**2.8%**

APPENDIX D

The Use of Historical Returns to Measure an Expected Risk Premium

Appendix D
The Use of Historical Returns to Measure an Expected Risk Premium

It is quite common for analysts to estimate an equity or market risk premium as the difference between historical stock and bond returns. However, using the historical relationship between stock and bond returns to measure an ex ante equity risk premium can produce an inflated measure of the true market or equity risk premium. 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. More significantly, there are a number of empirical issues that can result in historical returns being poor measures of the expected risk premium.

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

(A) Biased historical bond returns

(B) Use of the arithmetic versus the geometric mean return

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

(D) Unattainable and biased historical stock returns

(E) Company Survivorship bias

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

These issues will be addressed in order.

A. Biased Historical Bond Returns

An essential assumption of this approach is that over long periods of time,

investors' expectations are realized. However, the experienced returns of bondholders in the past invalidate 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.

B. The Arithmetic versus the Geometric Mean Return

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."[1] When a historic stock and bond return 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.

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

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

selling for $100 today, increases to $200 in one year, and then falls back to $100 in two years. The table below shows the prices and returns.

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

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the SEC requires equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[2] Therefore, the historic arithmetic mean return measures are biased and should be disregarded.

Nonetheless, in measuring historic returns to develop an expected equity risk premium, finance texts will often recommend the use of an arithmetic mean return as a measure of central tendency. A common justification for using the arithmetic mean return is that since annual stock returns are not serially correlated, the best measure of a return for next year is the arithmetic mean of past

[2] SEC, Form N-1A.

returns. On the other hand, Damodaran suggests that such an estimate is not appropriate in estimating an equity risk premium:[3]

> "There are, however, strong arguments that can be made for the use of geometric averages. First, empirical studies seem to indicate that returns on stocks are negatively correlated over long periods of time. Consequently, the arithmetic average return is likely to overstate the premium. Second, while asset pricing models may be single period models, the use of these models to get expected returns over long periods (such as five or ten years) suggests that the estimation period may be much longer than a year. In this context, the argument for geometric average premiums becomes stronger."

C. The Error in Measuring Equity Risk Premiums with Historic Data

Measuring the equity risk premium using historical stock and bond returns is subject to a substantial forecasting error. For example, the arithmetic mean long-term equity risk premium of approximately 6.5% has a standard deviation of over 20.0%. 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%, +/- 2 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 substantial amount of error.

D. Unattainable and Biased Historic Stock Returns

Returns developed using Ibbotson's methodology are computed on stock indexes and therefore: (1) cannot be reflective of expectations because these returns

[3]Aswath. Damodaran, "A New "Risky" World Order: Unstable Risk Premiums - Implications for Practice" NUU Working Paper, 2010, p. 25.

are unattainable to investors and (2) produce biased results. This methodology assumes: (1) monthly portfolio rebalancing and (2) 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 generates high transaction costs and thereby renders these returns unattainable to investors. In addition, an academic study demonstrates that the monthly portfolio rebalancing assumption produces biased estimates of stock returns.[4]

Transaction costs themselves provide another bias in historic versus expected returns. In the past, the observed stock returns 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.

E. Company Survivorship Bias

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 well were dropped from these indexes is not reflected. Therefore, these stock returns are

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

upwardly biased because they only reflect the returns from more successful companies.

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

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

F. One of the Biggest Mistakes in Teaching Finance

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.[5] 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.

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

EXHIBITS

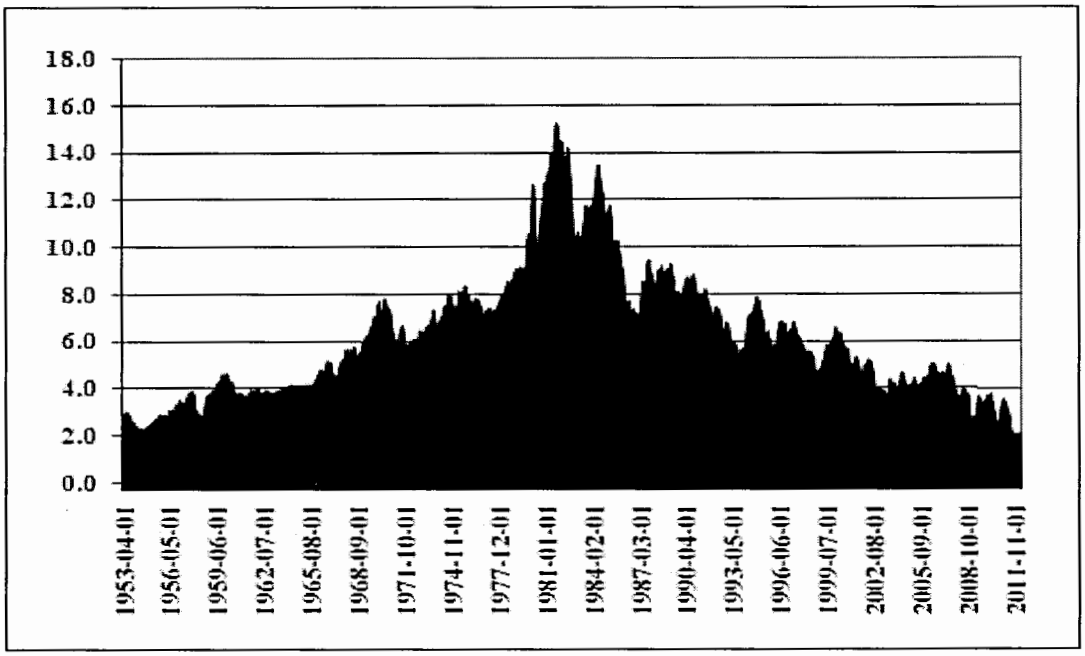
JRW-1 thru JRW-16

Exhibit JRW-1
Kansas Gas Service
Weighted Average Cost of Capital

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	50.00%	5.33%	2.67%
Common Equity	50.00%	8.50%	4.25%
Total	100.00%		6.92%

Exhibit JRW-2

Panel A
Ten-Year Treasury Yields
1953-Present



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

Panel B
Long-Term Moody's Baa Yields Minus Ten-Year Treasury Yields
2000-Present

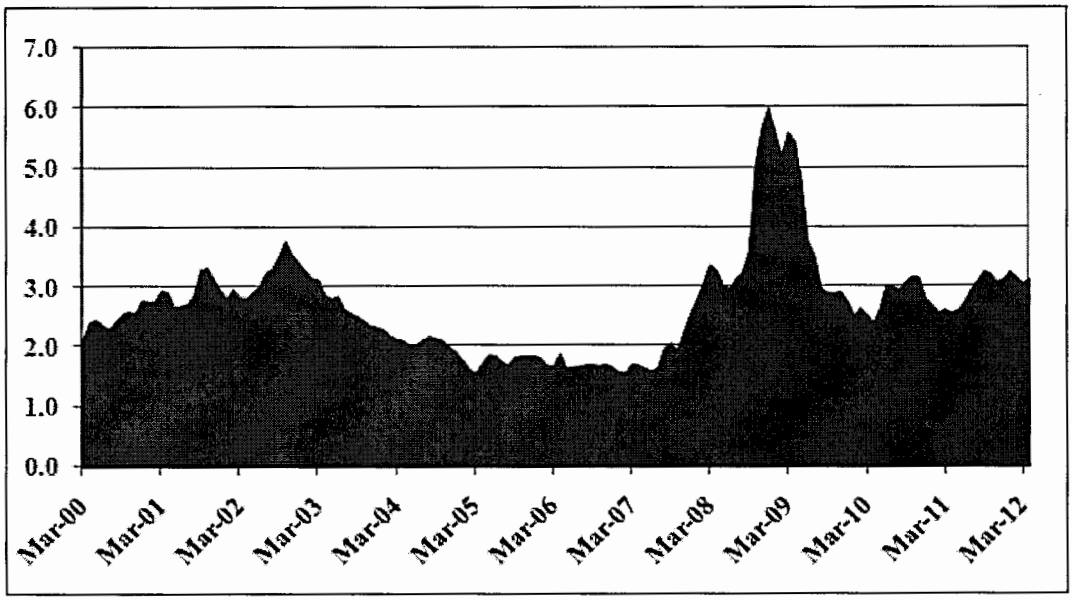
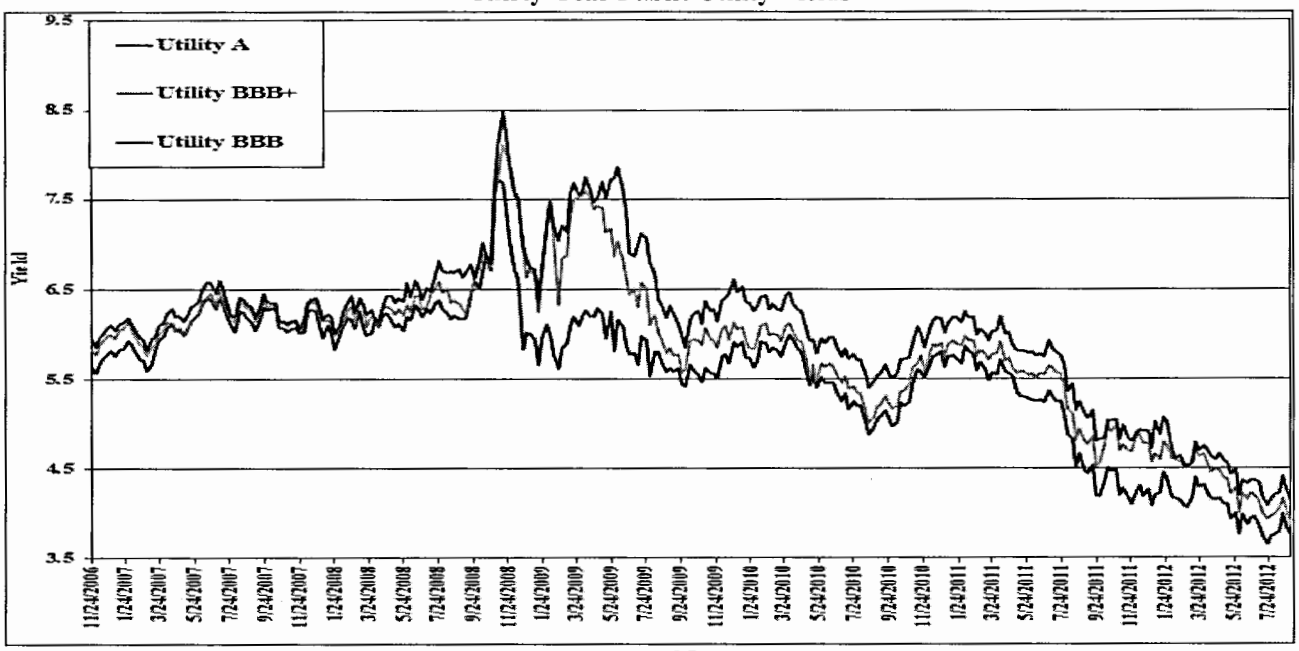


Exhibit JRW-3
Panel A
Thirty-Year Public Utility Yields



Panel B
Thirty-Year Public Utility Yield Spread Over Treasuries

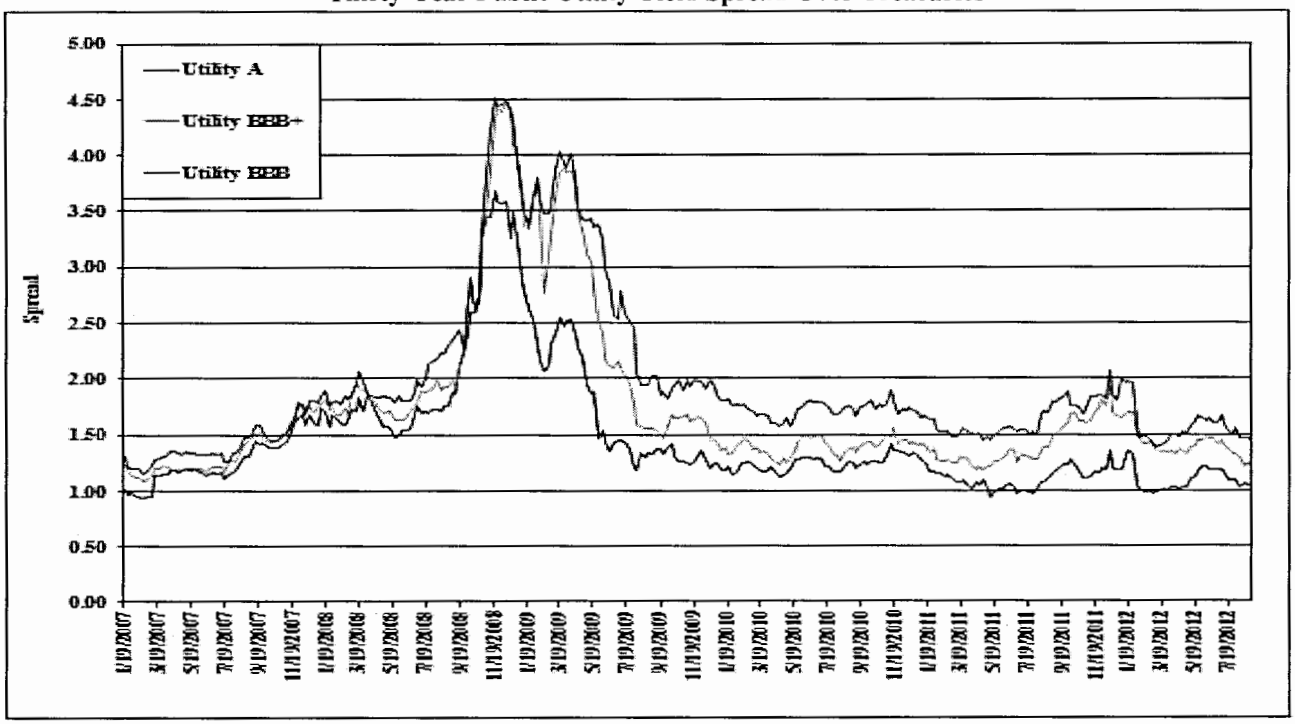
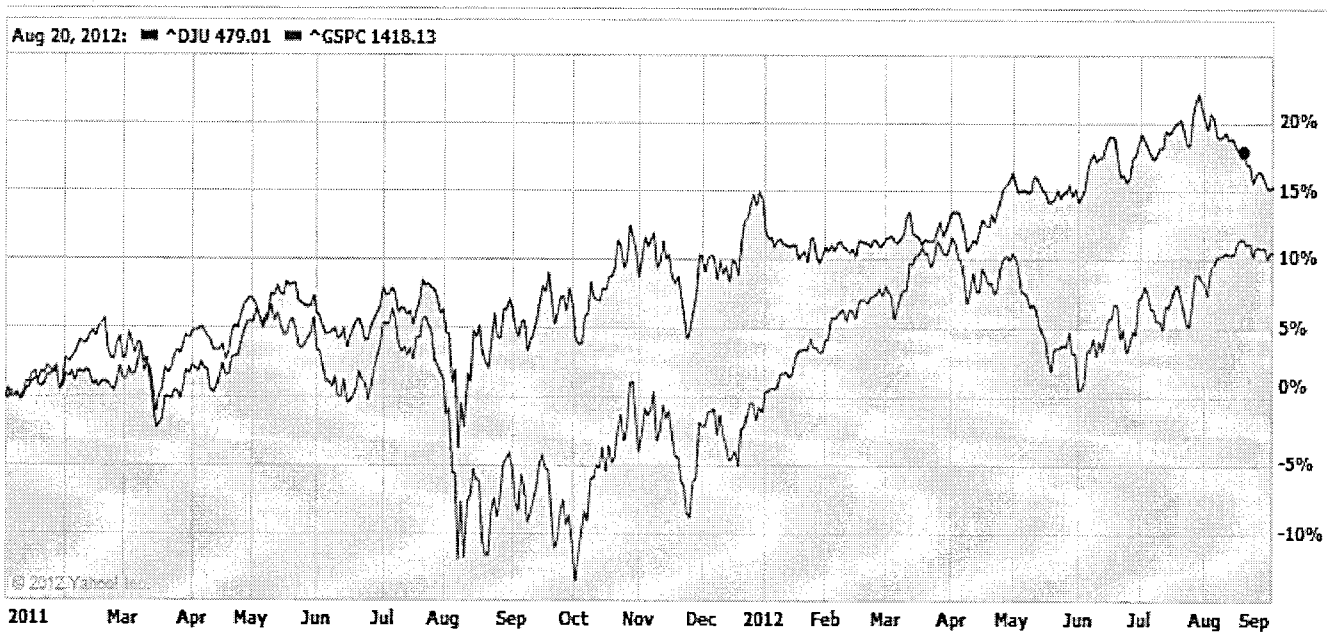


Exhibit JRW-3

Dow Jones Utility Index vs. S&P 500 - 12 Months



Data Source: www.yahoo.com

Exhibit JRW-4
Kansas Gas Service
Summary Financial Statistics

Gas Proxy Group

Company	Operating Revenue ($mil)	Percent Gas Revenue	Net Plant ($mil)	Market Capital ($bil)	S&P Bond Rating	Moody's Bond Rating	Pre-Tax Interest Coverage	Primary Service Area	Common Equity Ratio	Return on Equity	Market to Book Ratio
AGL Resources Inc. (NYSE-AGL)	2,864.0	73	7,973.0	4.70	A+	Aa3	6.5	GA,TN,VA,NJ,FL,MD,IL	44.2	6.7	1.37
Atmos Energy Corporation (NYSE-ATO)	3,977.5	62	5,334.0	3.30	BBB+	Baa2	3.1	LA,KY,TX,MS,CO,KS,KY	49.8	7.6	1.40
Laclede Group, Inc. (NYSE-LG)	1,384.4	58	957.7	1.12	A	A2	4.7	MO	62.8	11.4	1.50
Northwest Natural Gas Co. (NYSE-NWN)	843.2	44	1,900.9	1.40	A+	A1	7.0	OR,WA	49.7	8.7	1.77
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	1,169.6	100	2,813.6	3.32	A	A3	3.4	NC,SC,TN	50.2	10.2	2.18
South Jersey Industries, Inc. (NYSE-SJI)	771.5	63	1,387.0	1.60	A	A2	5.7	NJ	46.4	14.4	2.40
Southwest Gas Corporation (NYSE-SWX)	1,916.4	72	3,234.9	2.10	BBB+	Baa1	3.5	AZ,NV,CA	48.2	9.7	1.62
WGL Holdings, Inc. (NYSE-WGL)	2,505.6	44	2,547.6	2.10	A+	A2	5.7	DC,MD,VA	62.6	7.6	1.63
Mean	1,929.0	65	3,268.6	2.46	A/A-	A2/A3	5.0		51.7	9.5	1.73
Median	1,650.4	63	2,680.6	2.10	A/A-	A2/A3	5.2		49.8	9.2	1.63

Data Source: AUS *Utility Reports*, August, 2012; Market Capital, Pre-Tax Interest Coverage and Primary Service Territory are from *Value Line Investment Survey*, 2012.

Exhibit JRW-5
Kansas Gas Service
Capital Structure Ratios and Debt Cost Rate

Panel A -Kansas Gas Service Recommended Capitalization Ratios and Debt Cost Rates

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	41.15%	5.33%
Common Equity	58.85%	
Total	100.00%	

Panel B - ONEOK, Inc. and Subsidiaries Capitalization Ratios Including Short-Term Debt - 3-31-12

Short-Term Debt	419,757	4.19%
Long-Term Debt	5,225,849	52.13%
Common Equity	4,379,455	43.69%
Total Capital	10,025,061	100.00%

Panel C - Gas Proxy Group Capitalization Ratios

	3/31/2012	12/31/2011	9/30/2011	6/30/2011	Mean
Short-Term Debt	12.37%	16.19%	10.45%	9.13%	12.04%
Long-Term Debt	34.41%	33.59%	39.49%	37.82%	36.33%
Preferred Stock	0.17%	0.16%	0.18%	0.18%	0.17%
Common Equity	53.05%	50.06%	49.87%	52.87%	51.46%
Total Capital	100.00%	100.00%	100.00%	100.00%	100.00%

Panel D - CURB Recommended Capitalization Ratios

Capital Source	Capitalization Ratio	Cost Rate
Long-Term Debt	50.00%	5.33%
Common Equity	50.00%	
Total Capital	100.00%	

Exhibit JRW-5
Kansas Gas Service
Capital Structure Ratios
Gas Proxy Group

		3/31/12	12/31/11	9/30/11	6/30/11		3/31/12	12/31/11	9/30/11	6/30/11
GAS						GAS				
	Short Term Debt	823,000	1,420,000	62,000	176,000	Short Term Debt	14.45%	22.89%	1.34%	4.14%
	Long-Term Debt	1,447,000	1,445,000	2,687,000	2,164,000	Long-Term Debt	25.40%	23.29%	58.03%	50.87%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	3,426,000	3,339,000	1,881,000	1,914,000	Common Equity	60.15%	53.82%	40.63%	44.99%
	Total	5,696,000	6,204,000	4,630,000	4,254,000	Total	100.00%	100.00%	100.00%	100.00%
ATO						ATO				
	Short Term Debt	424,127	390,116	208,830	2,434	Short Term Debt	8.95%	8.02%	4.47%	0.05%
	Long-Term Debt	1,956,213	2,206,193	2,206,117	2,206,106	Long-Term Debt	41.26%	45.36%	47.24%	48.55%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	2,360,712	2,267,762	2,255,421	2,335,824	Common Equity	49.79%	46.62%	48.29%	51.40%
	Total	4,741,052	4,864,071	4,670,368	4,544,364	Total	100.00%	100.00%	100.00%	100.00%
LG						LG				
	Short Term Debt	25,000	138,000	46,000		Short Term Debt	2.55%	12.93%	4.68%	0.00%
	Long-Term Debt	339,386	339,372	364,357	364,343	Long-Term Debt	34.65%	31.80%	37.04%	38.60%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	615,204	589,670	573,331	579,551	Common Equity	62.80%	55.26%	58.28%	61.40%
	Total	979,590	1,067,042	983,688	943,894	Total	100.00%	100.00%	100.00%	100.00%
NWN						NWN				
	Short Term Debt	167,397	238,917	267,851	251,386	Short Term Debt	10.76%	14.98%	17.10%	16.56%
	Long-Term Debt	641,700	641,700	601,700	551,700	Long-Term Debt	41.27%	40.23%	38.42%	36.35%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	745,971	714,488	696,605	714,628	Common Equity	47.97%	44.79%	44.48%	47.09%
	Total	1,555,068	1,595,105	1,566,156	1,517,714	Total	100.00%	100.00%	100.00%	100.00%
PNY						PNY				
	Short Term Debt	457,500	331,000	329,500	360,343	Short Term Debt	21.16%	16.53%	16.26%	19.14%
	Long-Term Debt	675,000	675,000	675,000	475,000	Long-Term Debt	31.21%	33.70%	33.30%	25.24%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	1,030,086	996,923	1,022,238	1,046,944	Common Equity	47.63%	49.77%	50.44%	55.62%
	Total	2,162,586	2,002,923	2,026,738	1,882,287	Total	100.00%	100.00%	100.00%	100.00%
SJI						SJI				
	Short Term Debt	381,412	362,325	297,594	238,656	Short Term Debt	25.85%	25.68%	22.59%	18.77%
	Long-Term Debt	426,400	424,213	424,213	426,400	Long-Term Debt	28.90%	30.07%	32.20%	33.54%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	667,792	624,114	595,473	606,270	Common Equity	45.26%	44.24%	45.20%	47.69%
	Total	1,475,604	1,410,652	1,317,280	1,271,326	Total	100.00%	100.00%	100.00%	100.00%
SWX						SWX				
	Short Term Debt	205,055	322,618	221,102	200,000	Short Term Debt	7.63%	13.01%	9.42%	8.46%
	Long-Term Debt	1,188,076	930,858	936,857	941,551	Long-Term Debt	44.19%	37.54%	39.93%	39.82%
	Preferred Stock					Preferred Stock	0.00%	0.00%	0.00%	0.00%
	Common Equity	1,295,625	1,226,020	1,188,254	1,223,145	Common Equity	48.19%	49.45%	50.65%	51.73%
	Total	2,688,756	2,479,496	2,346,213	2,364,696	Total	100.00%	100.00%	100.00%	100.00%
WGL						WGL				
	Short Term Debt	156,961	338,421	153,314	118,118	Short Term Debt	7.61%	15.48%	7.78%	5.95%
	Long-Term Debt	585,804	584,041	587,213	587,239	Long-Term Debt	28.39%	26.71%	29.79%	29.57%
	Preferred Stock	28,173	28,173	28,173	28,173	Preferred Stock	1.37%	1.29%	1.43%	1.42%
	Common Equity	1,292,414	1,235,719	1,202,715	1,252,176	Common Equity	62.64%	56.52%	61.01%	63.06%
	Total	2,063,352	2,186,354	1,971,415	1,985,706	Total	100.00%	100.00%	100.00%	100.00%

Summary		3/31/12	12/31/11	9/30/11	6/30/11	Mean
Mean	Short Term Debt	12.37%	16.19%	10.45%	9.13%	12.04%
	Long-Term Debt	34.41%	33.59%	39.49%	37.82%	36.33%
	Preferred Stock	0.17%	0.16%	0.18%	0.18%	0.17%
	Common Equity	53.05%	50.06%	49.87%	52.87%	51.46%
	Total	100.00%	100.00%	100.00%	100.00%	100.0%

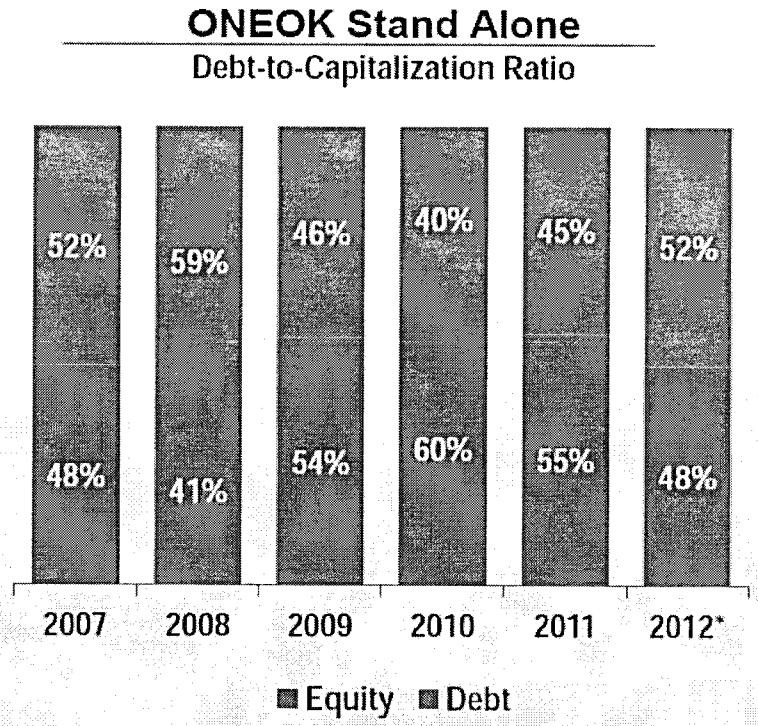
Source: www.yahoo.com, 10-Q and 10-k Reports

Exhibit JRW-5
Kansas Gas Service
Capital Structure Ratios and Debt Cost Rate

Strong Balance Sheet

Investment Grade

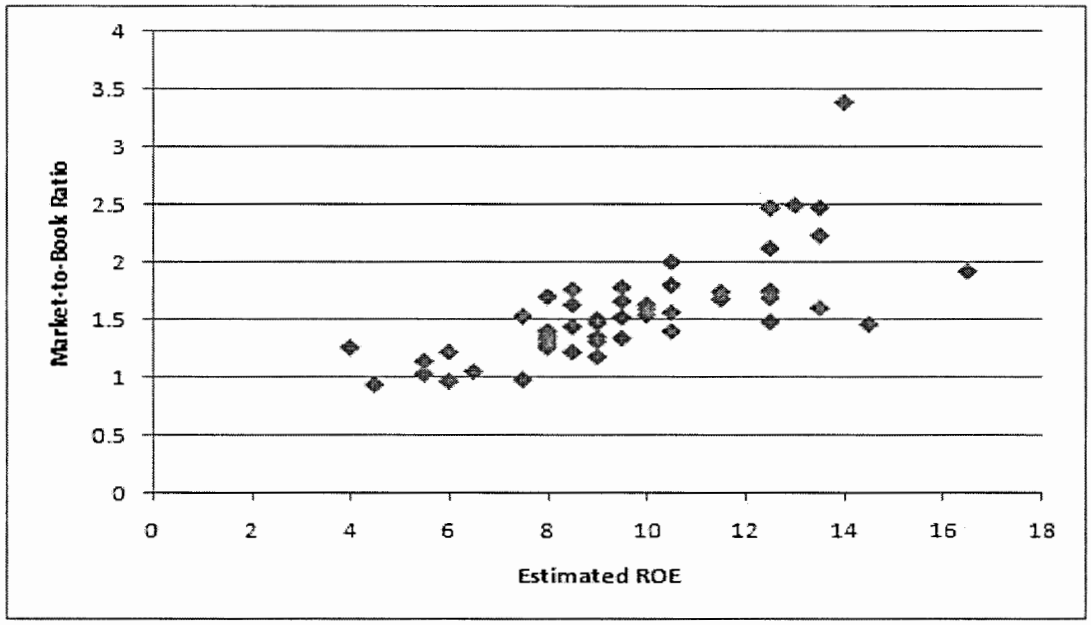
- Commitment to investment-grade credit rating
  - S&P: BBB (stable)
  - Moody's: Baa2 (stable)
- Capital structure
  - Goal: 50/50 capitalization
- $1.2 billion revolving credit facility
- $700 million senior notes offering completed January 2012
- Purchased 8 million OKS common units in March 2012 for $460 million
  - Increased ownership to 43.4%
  - Contributed $19.1 million to maintain 2% general partner interest



ONEOK

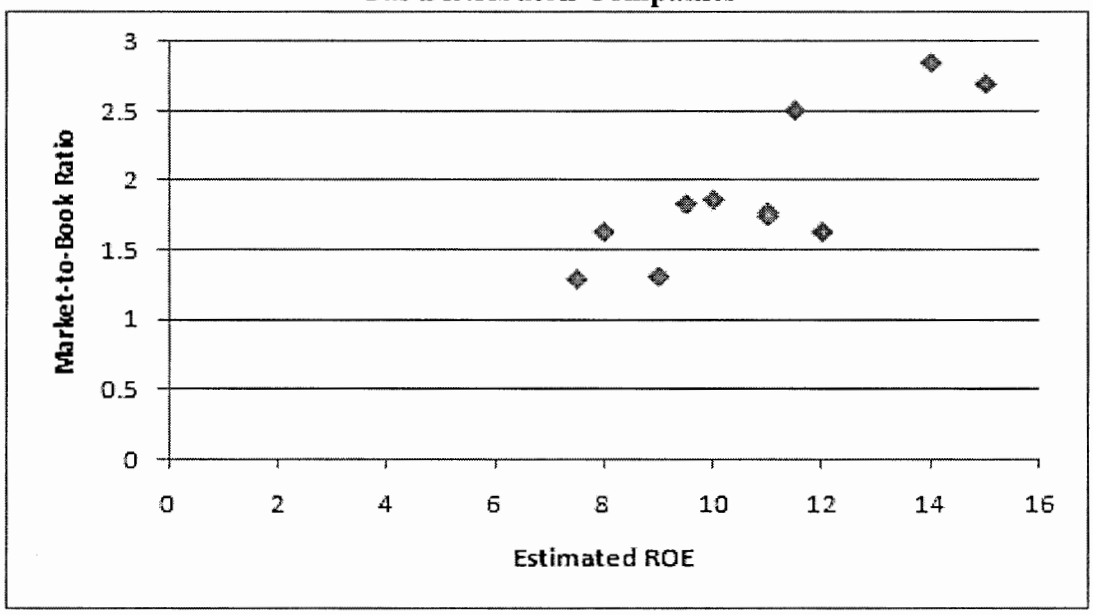
Attachment JRW-6

Panel A
Electric Utility Companies



R-Square = .52, N=51.

Panel B
Gas Distributon Companies

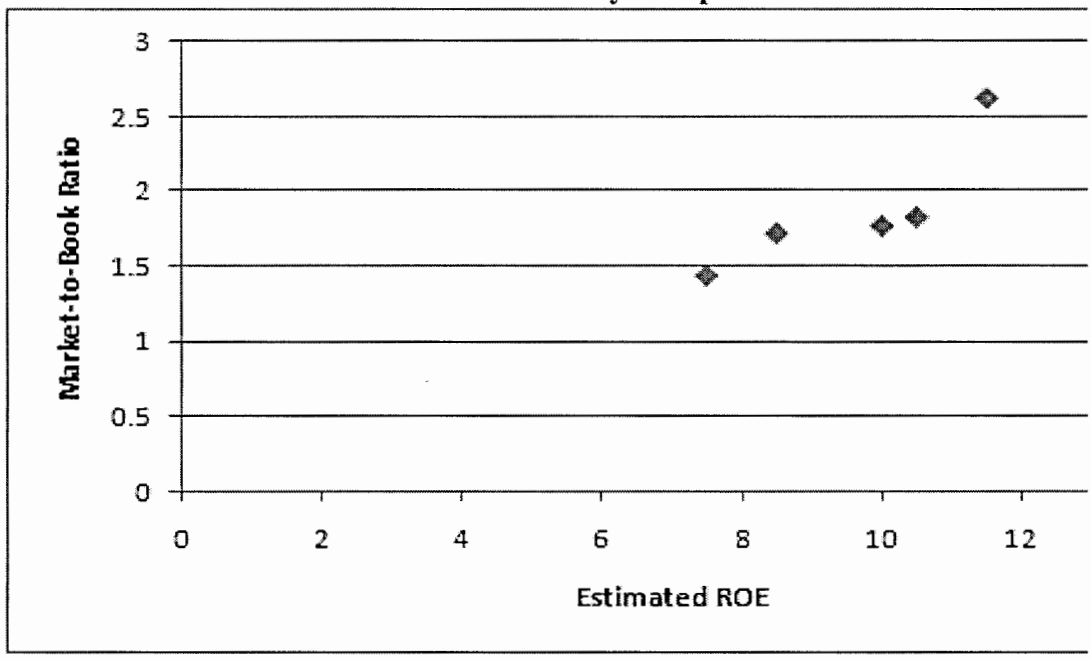


R-Square = .71, N=11.

Data Source: *Value Line Investment Survey.*

Attachment JRW-6

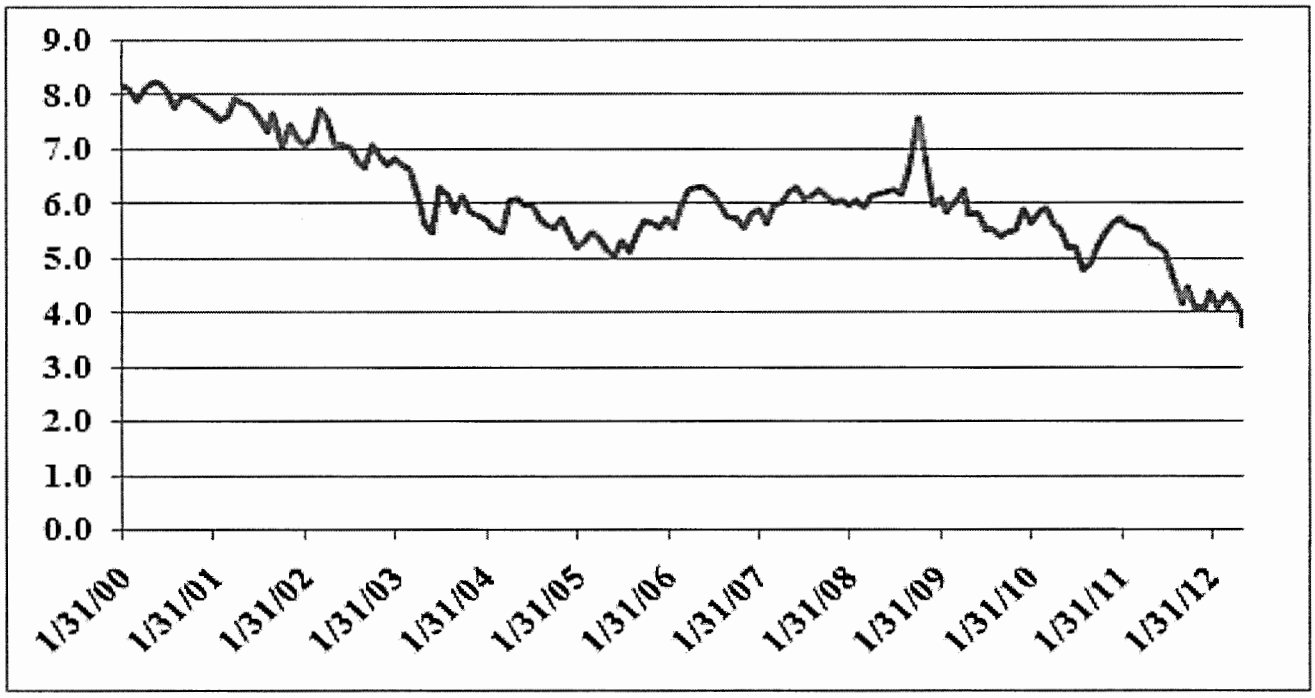
Panel C
Water Utility Companies



R-Square = .77, N=5.

Data Source: *Value Line Investment Survey.*

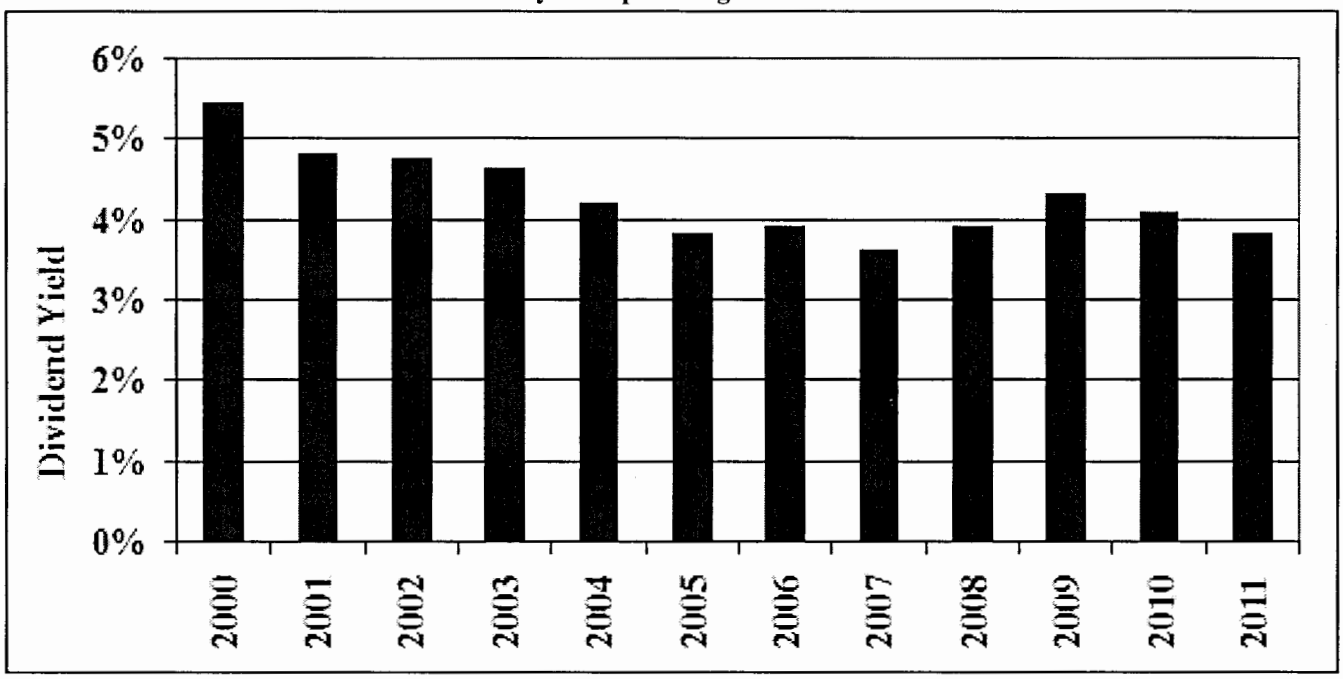
Exhibit JRW-7
Long-Term 'A' Rated Public Utility Bonds



Data Source: Bloomberg

Exhibit JRW-7

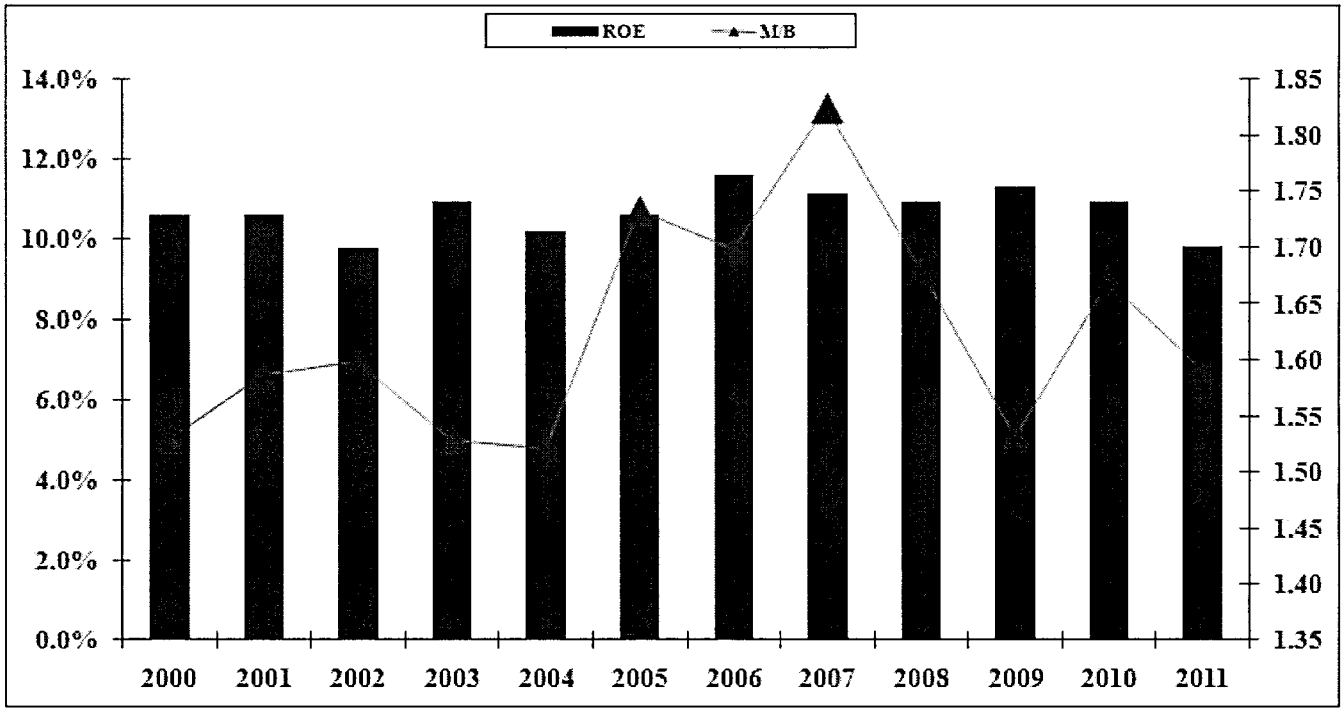
Gas Proxy Group Average Dividend Yield



Data Source: *Value Line Investment Survey.*

Exhibit JRW-7

Gas Proxy Group Average Return on Equity and Market-to-Book Ratios



Data Source: *Value Line Investment Survey.*

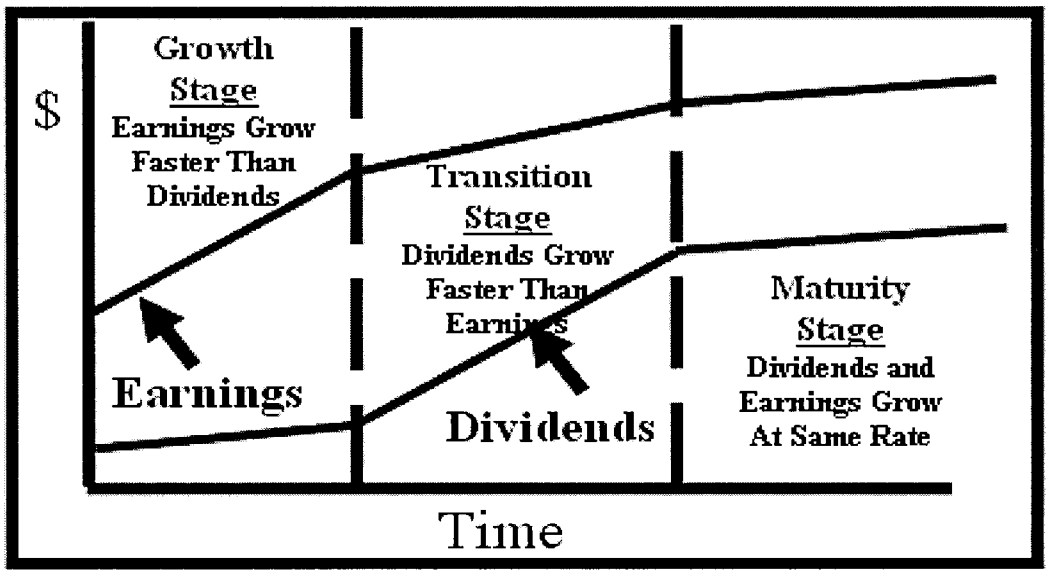
Exhibit JRW-8

Industry Average Betas

Industry Name	No.	Beta	Industry Name	No.	Beta	Industry Name	No.	Beta
Public/Private Equity	11	2.18	Natural Gas (Div.)	29	1.33	IT Services	60	1.06
Advertising	31	2.02	Financial Svcs. (Div.)	225	1.31	Retail Building Supply	8	1.04
Furn/Home Furnishings	35	1.81	Toiletries/Cosmetics	15	1.30	Computer Software	184	1.04
Heavy Truck & Equip	21	1.80	Apparel	57	1.30	Med Supp Non-Invasive	146	1.03
Semiconductor Equip	12	1.79	Computers/Peripherals	87	1.30	Biotechnology	158	1.03
Retail (Hardlines)	75	1.77	Retail Store	37	1.29	E-Commerce	57	1.03
Newspaper	13	1.76	Chemical (Specialty)	70	1.28	Telecom. Equipment	99	1.02
Hotel/Gaming	51	1.74	Precision Instrument	77	1.28	Pipeline MLPs	27	0.98
Auto Parts	51	1.70	Wireless Networking	57	1.27	Telecom. Services	74	0.98
Steel	32	1.68	Restaurant	63	1.27	Oil/Gas Distribution	13	0.96
Entertainment	77	1.63	Shoe	19	1.25	Utility (Foreign)	4	0.96
Metal Fabricating	24	1.59	Publishing	24	1.25	Industrial Services	137	0.93
Automotive	12	1.59	Trucking	36	1.24	Bank (Midwest)	45	0.93
Insurance (Life)	30	1.58	Human Resources	23	1.24	Reinsurance	13	0.93
Oilfield Svcs/Equip.	93	1.55	Entertainment Tech	40	1.23	Food Processing	112	0.91
Coal	20	1.53	Engineering & Const	25	1.22	Medical Services	122	0.91
Chemical (Diversified)	31	1.51	Air Transport	36	1.21	Insurance (Prop/Cas.)	49	0.91
Building Materials	45	1.50	Machinery	100	1.20	Beverage	34	0.88
Semiconductor	141	1.50	Securities Brokerage	28	1.20	Telecom. Utility	25	0.88
R.E.I.T.	5	1.47	Petroleum (Integrated)	20	1.18	Tobacco	11	0.85
Homebuilding	23	1.45	Healthcare Information	25	1.17	Med Supp Invasive	83	0.85
Recreation	56	1.45	Packaging & Container	26	1.16	Educational Services	34	0.83
Railroad	12	1.44	Precious Metals	84	1.15	Environmental	82	0.81
Retail (Softlines)	47	1.44	Diversified Co.	107	1.14	Bank	426	0.77
Maritime	52	1.40	Funeral Services	6	1.14	Electric Util. (Central)	21	0.75
Office Equip/Supplies	24	1.38	Property Management	31	1.13	Electric Utility (West)	14	0.75
Cable TV	21	1.37	Pharmacy Services	19	1.12	Retail/Wholesale Food	30	0.75
Retail Automotive	20	1.37	Drug	279	1.12	Thrift	148	0.71
Chemical (Basic)	16	1.36	Aerospace/Defense	64	1.10	Electric Utility (East)	21	0.70
Paper/Forest Products	32	1.36	Foreign Electronics	9	1.09	Natural Gas Utility	22	0.66
Power	93	1.35	Internet	186	1.09	Water Utility	11	0.66
Petroleum (Producing)	176	1.34	Information Services	27	1.07	**Total Market**	**5891**	**1.15**
Electrical Equipment	68	1.33	Household Products	26	1.07			
Metals & Mining (Div.)	73	1.33	Electronics	139	1.07			

Source: Damodaran Online 2012 - http://pages.stern.nyu.edu/~adamodar/

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

Kansas Gas Service
Discounted Cash Flow Analysis

Gas Proxy Group

Dividend Yield*	3.90%
Adjustment Factor	1.0225
Adjusted Dividend Yield	4.0%
Growth Rate**	4.50%
Equity Cost Rate	8.5%

* Page 2 of Exhibit JRW-10

** Based on data provided on pages 3, 4, 5, and 6 of Exhibit JRW-10

Exhibit JRW-10

Kansas Gas Service
Monthly Dividend Yields

Gas Proxy Group

Company	Mar	Apr	May	Jun	Jul	Aug	Mean
AGL Resources Inc. (NYSE-ATG)	3.5%	3.7%	3.8%	5.0%	4.9%	4.6%	4.3%
Atmos Energy Corporation (NYSE-ATO)	4.4%	4.5%	4.4%	4.2%	4.1%	3.8%	4.2%
Laclede Group, Inc. (NYSE-LG)	4.0%	4.2%	4.3%	4.3%	4.3%	4.1%	4.2%
Northwest Natural Gas Co. (NYSE-NWN)	3.8%	3.9%	4.0%	3.9%	3.7%	3.6%	3.8%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	3.5%	3.7%	4.1%	4.1%	3.8%	3.7%	3.8%
South Jersey Industries, Inc. (NYSE-SJI)	3.0%	3.2%	3.3%	3.4%	3.2%	3.1%	3.2%
Southwest Gas Corporation (NYSE-SWX)	2.5%	2.5%	2.6%	2.8%	2.7%	2.6%	2.6%
WGL Holdings, Inc. (NYSE-WGL)	3.8%	3.8%	4.1%	4.2%	4.0%	3.9%	4.0%
Mean	3.6%	3.7%	3.8%	4.0%	3.8%	3.7%	3.8%
Median	3.7%	3.8%	4.1%	4.2%	3.9%	3.8%	3.9%

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

Exhibit JRW-10

Kansas Gas Service
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)	9.0%	5.0%	7.0%	4.5%	7.5%	5.5%
Atmos Energy Corporation (NYSE-ATO)	7.0%	1.5%	6.5%	4.0%	1.5%	4.5%
Laclede Group, Inc. (NYSE-LG)	6.5%	1.5%	5.0%	6.0%	2.5%	6.5%
Northwest Natural Gas Co. (NYSE-NWN)	4.0%	3.0%	4.0%	4.5%	4.5%	4.0%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	5.0%	4.5%	5.0%	4.5%	4.0%	3.0%
South Jersey Industries, Inc. (NYSE-SJI)	9.5%	6.5%	10.5%	7.0%	9.5%	7.0%
Southwest Gas Corporation (NYSE-SWX)	6.0%	2.0%	4.5%	6.5%	4.0%	5.0%
WGL Holdings, Inc. (NYSE-WGL)	3.0%	2.0%	4.0%	3.0%	2.5%	5.0%
Mean	6.3%	3.3%	5.8%	5.0%	4.5%	5.1%
Median	6.3%	2.5%	5.0%	4.5%	4.0%	5.0%
	Average of Median Figures =			4.5%		

Data Source: *Value Line Investment Survey.*

Exhibit JRW-10

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
***Value Line* Projected Growth Rates**

Gas Proxy Group

Company	*Value Line* Projected Growth Est'd. '09-'11 to '15-'17			*Value Line* Sustainable Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
AGL Resources Inc. (NYSE-ATG)	8.0%	2.0%	5.0%	12.5%	52.0%	6.5%
Atmos Energy Corporation (NYSE-ATO)	4.0%	1.5%	6.0%	8.0%	46.0%	3.7%
Laclede Group, Inc. (NYSE-LG)	2.0%	2.5%	4.5%	11.5%	42.0%	4.8%
Northwest Natural Gas Co. (NYSE-NWN)	4.5%	2.5%	2.0%	12.0%	44.0%	5.3%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	2.5%	3.5%	1.5%	13.0%	28.0%	3.6%
South Jersey Industries, Inc. (NYSE-SJI)	9.0%	9.0%	6.5%	15.0%	47.0%	7.1%
Southwest Gas Corporation (NYSE-SWX)	9.0%	8.0%	6.0%	10.5%	58.0%	6.1%
WGL Holdings, Inc. (NYSE-WGL)	3.5%	2.5%	4.0%	10.0%	39.0%	3.9%
Mean	5.3%	3.9%	4.4%	11.6%	44.5%	5.1%
Median	4.3%	2.5%	4.8%	11.8%	45.0%	5.1%
Average of Median Figures =		3.8%			Median =	5.1%

Data Source: *Value Line Investment Survey.*

Exhibit JRW-10

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
Analysts Projected EPS Growth Rate Estimates

Gas Proxy Group

Company	Yahoo	Zack's	Reuters	Average
AGL Resources Inc. (NYSE-GAS)	-5.7%	4.3%	5.0%	1.2%
Atmos Energy Corporation (NYSE-ATO)	5.5%	5.2%	5.3%	5.3%
Laclede Group, Inc. (NYSE-LG)	5.3%	3.0%	5.0%	4.4%
Northwest Natural Gas Co. (NYSE-NWN)	4.5%	4.1%	4.3%	4.3%
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	4.6%	4.7%	5.2%	4.8%
South Jersey Industries, Inc. (NYSE-SJI)	6.0%	6.0%	7.0%	6.3%
Southwest Gas Corporation (NYSE-SWX)	4.1%	4.4%	2.5%	3.7%
WGL Holdings, Inc. (NYSE-WGL)	5.6%	5.4%	5.6%	5.5%
Mean	3.7%	4.6%	5.0%	4.4%
Median	4.9%	4.5%	5.1%	4.6%

Data Sources: www.reuters.com, www.zacks.com, http://quote.yahoo.com, August 21, 2012.

Exhibit JRW-10

Kansas Gas Service
DCF Growth Rate Indicators

Summary Growth Rates

Growth Rate Indicator	Gas Proxy Group
Historic *Value Line* Growth in EPS, DPS, and BVPS	4.5%
Projected *Value Line* Growth in EPS, DPS, and BVPS	3.8%
Sustainable Growth ROE * Retention Rate	5.1%
Projected EPS Growth from Yahoo, Zacks, and Reuters	4.6%
Average of Historic and Projected Growth Rates	4.5%
Average of Sustainable and Projected Growth Rates	4.5%

Date Source: Pages 3, 4, and 5 of Exhibit JRW-10

Exhibit JRW-11

Kansas Gas Service
Capital Asset Pricing Model

Gas Proxy Group

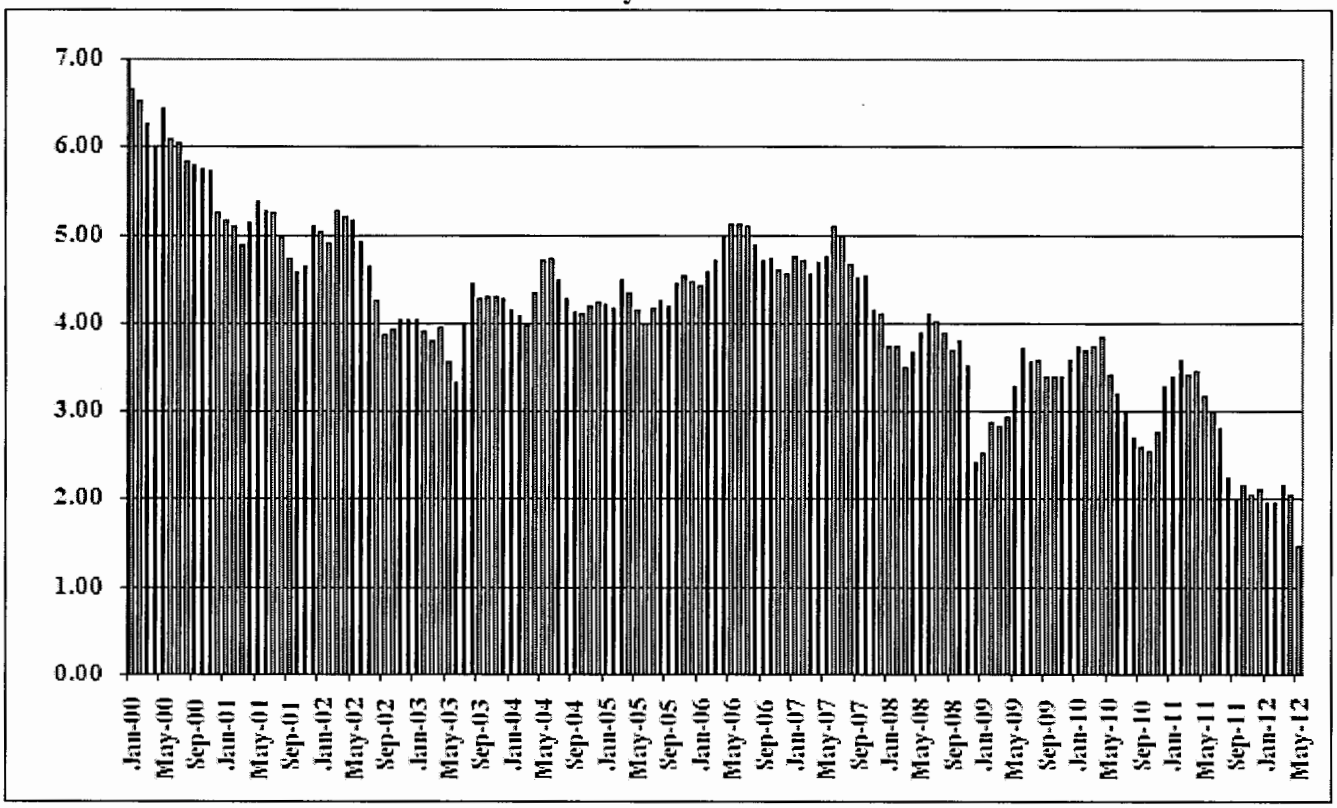
Risk-Free Interest Rate	**4.00%**
Beta*	**0.65**
Ex Ante Equity Risk Premium**	**5.00%**
CAPM Cost of Equity	**7.3%**

* See page 3 of Exhibit JRW-11

** See pages 5 and 6 of Exhibit JRW-11

Exhibit JRW-11

Panel A
Ten-Year U.S. Treasury Yields
January 2000-Present

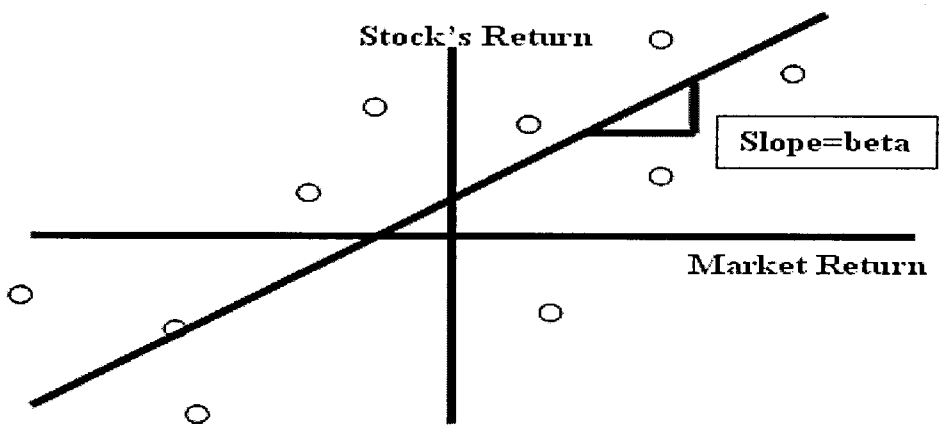


Data Source: http://research.stlouisfed.org/fred2/data/GS10.txt

Exhibit JRW-11

Panel A

Calculation of Beta



Gas Proxy Group

Company	
AGL Resources Inc. (NYSE-ATG)	0.75
Atmos Energy Corporation (NYSE-ATO)	0.70
Laclede Group, Inc. (NYSE-LG)	0.60
Northwest Natural Gas Co. (NYSE-NWN)	0.55
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	0.65
South Jersey Industries, Inc. (NYSE-SJI)	0.65
Southwest Gas Corporation (NYSE-SWX)	0.75
WGL Holdings, Inc. (NYSE-WGL)	0.65
Mean	0.66
Median	0.65

Data Source: *Value Line Investment Survey, 2012.*

Exhibit JRW-11

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

Kansas Gas Service
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	Median
Historical Risk Premium										
	Ibbotson	2012	1926-2011	Historical Stock Returns - Bond Returns	Arithmetic				5.70%	
					Geometric				4.10%	
	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%	
	Median									5.50%
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	2012	Projection	Fundamentals - Implied from FCF to Equity Model					6.11%	
	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%	
	Median									3.75%
Surveys										
	Survey of Financial Forecasters	2012	10-Year Projection	About 50 Financial Forecastsers					2.80%	
	Duke - CFO Magazine Survey	2012	10-Year Projection	Approximately 500 CFOs					4.50%	
	Welch - Academics	2008	30-Year Projection	Random Academics		5.00%	5.74%	5.37%	5.37%	
	Fernandez - Academics	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - Analysts	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2012	Long-Term	Survey of Companies					5.50%	
	Median									5.19%
Building Block										
	Ibbotson and Chen	2012	1926-2011	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2012	Current Supply Model (D/P & Earnings Growth)					4.90%	
	Median									4.93%
Mean										**4.84%**

Exhibit JRW-11

Kansas Gas Service
Capital Asset Pricing Model
Equity Risk Premium
Summary of 2010-12 Equity Risk Premium Studies

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	2012	1926-2011	Historical Stock Returns - Bond Returns	Arithmetic				5.70%	
					Geometric				4.10%	
	Median									4.90%
Ex Ante Models (Puzzle Research)										
	Damodoran	2012	Projection	Fundamentals - Implied from FCF to Equity Model					6.11%	
	Median									6.11%
Surveys										
	Survey of Financial Forecasters	2012	10-Year Projection	About 50 Financial Forecastsers					2.80%	
	Duke - CFO Magazine Survey	2012	10-Year Projection	Approximately 500 CFOs					4.50%	
	Fernandez - Academics	2012	Long-Term	Survey of Academics					5.60%	
	Fernandez - Analysts	2012	Long-Term	Survey of Analysts					5.00%	
	Fernandez - Companies	2012	Long-Term	Survey of Companies					5.50%	
	Median									5.00%
Building Block										
	Ibbotson and Chen	2012	1926-2011	Historical Supply Model (D/P & Earnings Growth)	Arithmetic			5.99%	4.95%	
					Geometric			3.91%		
	Woolridge		2012	Current Supply Model (D/P & Earnings Growth)					4.90%	
	Median									4.93%
Mean										**5.23%**
Median										**4.96%**

Exhibit JRW-12

Kansas Gas Service
Company's Proposed Cost of Capital

Capital Source	Capitalization Ratio	Cost Rate	Weighted Cost Rate
Long-Term Debt	41.15%	5.33%	2.19%
Common Equity	58.85%	10.75%	6.33%
Total	100.00%		8.52%

Panel A

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

Approach	Result
DCF	9.80%
CAPM	10.68%
Risk Premium	9.63%
Comparable Earnings	11.63%
Indicated Equity Cost Rate	10.43%
Recommended Equity Cost Rate	10.75%

Panel B

Summary of Mr. Fairchild's DCF Results

	DCF Growth = 5.5%	DCF Growth = 6.5%
Average Adjusted Dividend Yield	3.80%	3.80%
Growth*	5.50%	6.50%
DCF Result	9.30%	10.30%

* Expected EPS Growth from *Value Line*, I/B/E/S, Zacks, and Yahoo, and *Value Line* Sustainable Growth and Historical Growth

Panel C

Summary of Mr. Fairchild's CAPM Results

	MRP = 6.60%	MRP = 10.15%
Risk-Free Rate	3.28%	3.28%
Beta	0.67	0.67
Market Risk Premium	6.60%	10.22%
CAPM Result	7.72%	10.15%
Size Adjustment	1.74%	1.74%
CAPM-ECAPM Equity Cost Rate	9.46%	11.89%

Panel D

Summary of Mr. Fairchild's Risk Premium Results

Prospective Bond Yield	4.48%
Risk Premium	5.15%
Risk Premium Equity Cost Rate	9.63%

Panel E

Summary of Mr. Fairchild's Comparable Earnings Results

Approach	Result
Average Projected ROE	11.63%

Exhibit JRW-13

Kansas Gas Service
DCF Equity Cost Growth Rate Measures
Response to CURB Data Requests

Panel A
KGS Response to CURB-160

Question 1 (Prepared by David Dittemore)
With reference to page 28, lines 19-22, and Schedules BHF-4, BHF-5, and BHF-6, please provide: (1) the justification for the screens used to identify "clearly unreliable indicators of growth;" (2) a list of each of the figures identified as being "clearly unreliable indicators of growth;" and (3) a list of the growth rates that are identified as being "plausible."
Response:

The "clearly unreliable indicators of growth' on page 28, line 19, was a reference to the earlier discussion of Schedule BHF-6 on page 28, lines 12-14, where he states "Besides the fact that several of these growth rates, when combinted with the group's 3.79% dividend yield, imply implausible costs of equity estimates, the variation of these other growth rates results in them providing limited guidance to the prospective growth that investors expect." There were no formal "screens" used to identify "clearly unreliable indicators of growth". The growth rates for the proxy firms on Schedule BHF-6 that Dr. Fairchild regards as "clearly unreliable indicator of growth" are the 3.3%, 10-year historical growth in dividends and the 3.9%, 5-year historical growth in price per share.

Panel B
KGS Response to CURB-161

Question 1 (Prepared by David Dittemore)
With reference to page 28, lines 19-22, page 29, lines 1-2, and Schedules BHF-4, BHF-5, and BHF-6, please provide: (1) the individual company growth rates used by Yahoo Finance and Zacks for their gas distribution industries that result in industry growth rates of 7.68% and 9.0%.
Response:

Dr. Fairchild is not aware that the data requested underlying either the Yahoo Finance or Zacks industry growth rates are available; if it is, Dr. Fairchild does not have that data. Both Yahoo Finance and Zacks present their industry projected earnings growth rates along side the projected earnings growth rate for each LDC as a comparative measure of interest to investors.

Exhibit JRW-13

Kansas Gas Service
DCF Equity Cost Growth Rate Measures

Mr. Fairchild's Gas Group Growth Rate Measures

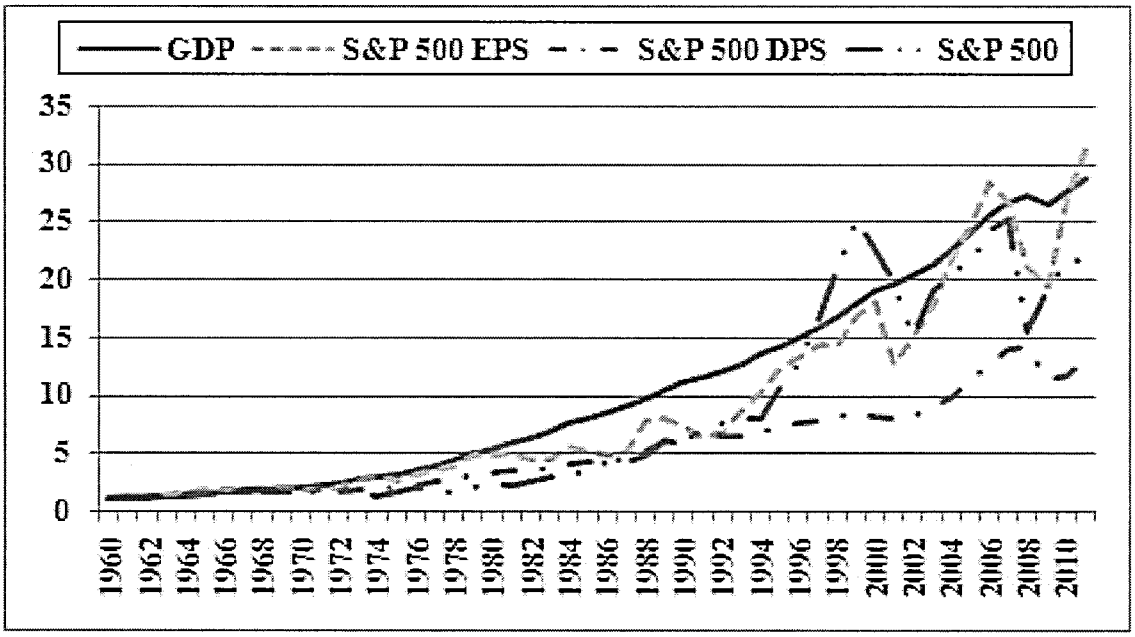
	Mean	Median
Value Line Projected EPS Growth	5.0%	4.0%
I/B/E/S Projected EPS Growth	4.2%	3.6%
Zack's Projected EPS Growth	4.7%	4.7%
Value Line 5-Year Historical EPS Growth	6.4%	6.5%
Value Line 10-Year Historical EPS Growth	5.8%	6.0%
Value Line Sustainable Growth	6.0%	5.6%
Value Line Projected BVPS Growth	4.7%	4.5%
Value Line 5-Year Historical BVPS Growth	6.0%	5.0%
Value Line 10-Year Historical BVPS Growth	5.5%	5.5%
Value Line Projected DPS Growth	4.0%	3.0%
Value Line 5-Year Historical DPS Growth	4.7%	4.0%
Value Line 10-Year Historical DPS Growth	3.3%	2.5%
Value Line Projected SPPS Growth	4.0%	4.4%
Value Line 5-Year Historical SPPS Growth	3.3%	5.5%
Value Line 10-Year Historical SPPS Growth	4.7%	4.7%
Mean	4.8%	4.6%
Median	4.7%	4.7%

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

	GDP	S&P 500	Earnings	Dividends	
1960	526.4	58.11	3.10	1.98	
1961	544.8	71.55	3.37	2.04	
1962	585.7	63.10	3.67	2.15	
1963	617.8	75.02	4.13	2.35	
1964	663.6	84.75	4.76	2.58	
1965	719.1	92.43	5.30	2.83	
1966	787.7	80.33	5.41	2.88	
1967	832.4	96.47	5.46	2.98	
1968	909.8	103.86	5.72	3.04	
1969	984.4	92.06	6.10	3.24	
1970	1038.3	92.15	5.51	3.19	
1971	1126.8	102.09	5.57	3.16	
1972	1237.9	118.05	6.17	3.19	
1973	1382.3	97.55	7.96	3.61	
1974	1499.5	68.56	9.35	3.72	
1975	1637.7	90.19	7.71	3.73	
1976	1824.6	107.46	9.75	4.22	
1977	2030.1	95.10	10.87	4.86	
1978	2293.8	96.11	11.64	5.18	
1979	2562.2	107.94	14.55	5.97	
1980	2788.1	135.76	14.99	6.44	
1981	3126.8	122.55	15.18	6.83	
1982	3253.2	140.64	13.82	6.93	
1983	3534.6	164.93	13.29	7.12	
1984	3930.9	167.24	16.84	7.83	
1985	4217.5	211.28	15.68	8.20	
1986	4460.1	242.17	14.43	8.19	
1987	4736.4	247.08	16.04	9.17	
1988	5100.4	277.72	24.12	10.22	
1989	5482.1	353.40	24.32	11.73	
1990	5800.5	330.22	22.65	12.35	
1991	5992.1	417.09	19.30	12.97	
1992	6342.3	435.71	20.87	12.64	
1993	6667.4	466.45	26.90	12.69	
1994	7085.2	459.27	31.75	13.36	
1995	7414.7	615.93	37.70	14.17	
1996	7838.5	740.74	40.63	14.89	
1997	8332.4	970.43	44.09	15.52	
1998	8793.5	1229.23	44.27	16.20	
1999	9353.5	1469.25	51.68	16.71	
2000	9951.5	1320.28	56.13	16.27	
2001	10286.2	1148.09	38.85	15.74	
2002	10642.3	879.82	46.04	16.08	
2003	11142.2	1111.91	54.69	17.88	
2004	11853.3	1211.92	67.68	19.41	
2005	12623.0	1248.29	76.45	22.38	
2006	13377.2	1418.30	87.72	25.05	
2007	14028.7	1468.36	82.54	27.73	
2008	14291.5	903.25	65.39	28.05	
2009	13939.0	1115.10	59.65	22.31	
2010	14526.5	1257.64	83.66	23.12	
2011	15094.0	1257.60	97.05	26.02	**Average**
Growth Rates	**6.80**	**6.21**	**6.98**	**5.18**	**6.29**

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

Long-Term Growth of GDP, S&P 500, S&P 500 EPS, and S&P 500 DPS



	GDP	S&P 500	S&P 500 EPS	S&P 500 DPS
Growth Rates	6.80	6.21	6.98	5.18

Panel A
Historic GDP Growth Rates

10-Year Average	4.2%
20-Year Average	4.9%
30-Year Average	5.8%
40-Year Average	6.9%
50-Year Average	6.9%
60-Year Average	6.9%
Average of Periods	6.0%

Panel B
Projected GDP Growth Rates

	Time Frame	Projected Nominal GDP Growth Rate
Congressional Budget Office	2012-2022	4.8%
Survey of Financial Forecasters	Ten Year	4.9%
Energy Information Administration	2009-2035	4.8%

Sources:
http://www.cbo.gov/sites/default/files/cbofiles/attachments/02-01-OutlookTestimonyHouse.pdf
http://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters/2012/survq112.cfm

Exhibit JRW-16
Kansas Gas Service
Percent of Regulated Gas Revenue

Rea Gas LDC Group

Company	Operating Revenue ($mil)	Percent Gas Revenue
WGL		100
AGL Resources Inc. (NYSE-AGL)	2,864.0	73
Atmos Energy Company (NYSE-ATO)	3,977.5	62
Laclede Group, Inc. (NYSE-LG)	1,384.4	58
New Jersey Resources (NYSE-NJR)	2,938.5	26
Northwest Natural Gas Co. (NYSE-NWN)	843.2	44
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	1,169.6	100
South Jersey Industries, Inc. (NYSE-SJI)	771.5	63
Southwest Gas Corporation (NYSE-SWX)	1,916.4	72
WGL Holdings, Inc. (NYSE-WGL)	2,505.6	44
Mean	2,041.2	60

Data Source: AUS *Utility Reports*, July, 2012.

CERTIFICATE OF SERVICE

12-KGSG-835-RTS

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing document was served by electronic service on this 24th day of September, 2012, to the following parties who have waived receipt of follow-up hard copies:

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