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

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

I. SUBJECT OF TESTIMONY AND SUMMARY OF RECOMMENDATIONS

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

A. I have been asked by the Kentucky Office of Attorney General ("OAG") to provide an opinion as to the overall fair rate of return or cost of capital for Kentucky American Water Company ("KAWC" or "Company") and to evaluate KAWC'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 KAWC, and detail the primary areas of contention between KAWC's rate of return position and the OAG's. Second, I provide an assessment of capital costs in today's capital

markets. Third, I discuss my proxy groups of water utility and gas distribution companies for estimating the cost of capital for KAWC. Fourth, I present my recommendations for the Company's capital structure and debt cost rate. Fifth, I discuss the concept of the cost of equity capital and then estimate the equity cost rate for KAWC. Finally, I critique the Company's rate of return analysis and testimony. I have included a table of contents which provides a more detailed outline.

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

A. I have used an adjusted capital structure that includes short-term debt. I have employed the Company's short-term and long-term debt cost rates. I have applied the Discounted Cash Flow Model ("DCF") and the Capital Asset Pricing Model ("CAPM") to two proxy groups of publicly-held water utility ("Water Proxy Group") and gas distribution companies ("Gas Proxy Group"). My analysis indicates an equity cost rate in the range of 7.3% to 9.3%. Within this range, I have used 9.25% as my equity cost rate for KAWC. I provide evidence in my testimony that this recommendation is consistent with the authorized returns on equity ("ROEs") for water companies.

Using my capital structure and debt and equity cost rates, I am recommending an overall rate of return of 7.50% for KAWC. These findings are summarized in Exhibit JRW-1.

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

A. The Company's rate of return testimony is offered by Mr. Michael A. Miller and Dr. James H. Vander Weide. Mr. Miller provides a recommended capital structure, senior capital cost rates, and overall rate of return. Dr. Vander Weide provides a recommended return on equity. The Company's proposed rate of return is inflated due to overstated debt and equity cost rates. Mr. Miller's short-term debt cost rate is excessive because he has used a projected LIBOR rate that is well above current market rates. In his long-term debt cost rate, Mr. Miller has employed interest rates on two pro forma financings that are above current market interest rates.

Dr. James A. Vander Weide provides the Company's equity cost rate. Dr. Vander Weide's estimated common equity cost rate is in the range of 10.8% - 12.1%. Within this range, the Company has requested an equity cost rate of 11.50%. We have both used DCF and CAPM approaches in estimating an equity cost rate for the Company. Dr. Vander Weide has also used a Risk Premium ("RP") approach to estimate an equity cost rate for KAWC. Dr. Vander Weide has applied these approaches to proxy groups of water utility and gas distribution companies.

In terms of the DCF approach, the two major areas of disagreement are (1) the appropriate adjustment to the DCF dividend yield and (2) most significantly, the estimation of the expected growth rate. With respect to (1), Dr. Vander Weide has made an inappropriate adjustment to the spot dividend

yield. With respect to (2), Dr. Vander Weide has relied exclusively on the forecasted earnings per share ("EPS") growth rates of Wall Street analysts and *Value Line* to compute the equity cost rate. I provide empirical evidence from new studies that demonstrate the long-term earnings growth rates of Wall Street analysts are overly optimistic and upwardly-biased. I also show that the estimated long-term EPS growth rates of *Value Line* are overstated. Consequently, in developing a DCF growth rate, I have used both historic and projected growth rate measures and have evaluated growth in dividends, book value, and earnings per share.

The RP and CAPM approaches require an estimate of the base interest rate and the equity risk premium. In both approaches, Dr. Vander Weide's base interest rate is above current market rates. However, the major area of disagreement involves our significantly different views on the alternative approaches to measuring the equity risk premium as well as the magnitude of equity risk premium. Dr. Vander Weide's equity risk premiums are excessive and do not reflect current market fundamentals. As I highlight in my testimony, there are three procedures for estimating an equity risk premium – historic returns, surveys, and expected return models. Dr. Vander Weide uses a historical equity risk premium which is based on historic stock and bond returns. He also calculates an expected risk premium in which he applies the DCF approach to the S&P 500 and public utility stock. I provide evidence that risk premiums based on historic stock and bond returns are subject to empirical errors which result in upwardly biased measures of expected equity

risk premiums. I also demonstrate that Dr. Vander Weide's projected equity risk premiums, which use analysts' EPS growth rate projections, include unrealistic assumptions regarding future economic and earnings growth and stock returns.

In his DCF, RP, and CAPM approaches, Dr. Vander Weide makes an unwarranted adjustment for flotation costs which serve to inflate his equity cost rate estimates.

In the end, the most significant areas of disagreement in measuring KAWC's cost of capital are: (1) the appropriate short-term and long-term debt cost rates; (3) the use of the earnings per share growth rates of Wall Street analysts and *Value Line* to measure expected DCF growth; (4) the measurement and magnitude of the equity risk premium used in CAPM and RP approaches; and (5) whether or not equity cost rate adjustments are needed to account for 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, and the economic recession. Overall, these economic developments led investors to seek out low risk investments. These yields have since increased to the 3.0% to 3.5% range as the markets have rebounded from the lows of the financial crisis.

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 return required by bond investors for the risk associated with investing in corporate bonds. The difference also reflects, to a much lesser 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% area until 2005, declined to 1.5% until late 2007, and then increased significantly in response to the current financial crisis. This differential peaked at 6.0% at the height of the financial crisis in November of 2008, due to tightening in credit markets, which increased corporate bond yields and the "flight to quality," which

decreased treasury yields. The differential has declined significantly over the past year.

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 estimating the equity risk premium, and the 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 5-7% 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, financial analysts, companies, and financial forecasters.

Q. PLEASE DISCUSS 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 late 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 then 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 AIG and Merrill Lynch, and the government takeover of Fannie Mae and Freddie Mac.

The spillover to the economy has been ongoing. According to the National Bureau of Economic Research, the economy slipped into a recession in the 4th quarter of 2007 and remains there. The unemployment rate has been in the 10.0% range for the past year. Inflationary pressures, which were tied to global growth and increases in commodity prices until mid-2008, largely disappeared in late 2008 and throughout 2009. A barrel of oil, which was nearly $150 in mid-2008, declined to the $30 range a year ago and now has increased to the $70 to $80 range. Other commodity prices also peaked in 2008, bottomed out in the first quarter of 2009, and now have rebounded. The stock market bottomed out in early March of 2009, and has increased 50% since that time. The increase in commodity and energy prices and the stock market since the first quarter of last year provides evidence that the financial markets have recovered significantly over the past year.

In response to the market crisis, the Federal Reserve ("Fed") took extraordinary steps in an effort to stabilize capital markets. Most significantly, the Fed has opened its lending facilities to numerous banking and investment firms to promote credit markets. As a result, the balance sheet of the Federal Reserve has grown by hundreds of billions of dollars in support of the financial system. The federal government has taken 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 has spent billions bailing out a number of prominent financial institutions, including AIG, Citigroup, and Bank of America. The government is also moving to bail 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.

In summary, the Federal Reserve and government have taken never-before seen actions and have provided or will provide extraordinary sums of money in various ways to rescue the economy, certain industries, and the credit markets.

Q. PLEASE PROVIDE ADDITIONAL INFORMATION ON THE RESPONSE OF THE FINANCIAL MARKETS TO THE ACTIONS OF THE U.S. GOVERNMENT.

A. As noted, the yields on U.S. Treasury securities declined to levels not seen since the 1950s. This reflects the "flight to quality" in the credit markets, as

investors sought out low risk investments. 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 declined to below 0.5% as the short-term credit markets have opened up and U.S. Treasury rates have remained low.

The long-term credit market remained tighter, but improved significantly during 2009. The credit crisis was associated with concerns among credit providers – mainly financial institutions – in terms of making loans and investing in bonds due to the overleveraging and perceived weakness of the economy. 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 to pre-crisis levels. For example, the yields on 'A' rated utility bonds, which peaked at over 7.50% in November of 2008, have declined to about 5.5% in June of 2010. 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 gradually decreased to pre-crisis levels.

In sum, the massive government spending and Federal Reserve actions have had an effect on the credit markets. The short-term credit market has

loosened up considerably. LIBOR rates peaked in the fall of 2008 and have remained below 1.0% for most of the past two years. Likewise, the long-term credit market has loosened considerably and credit spreads have declined to pre-crisis levels. In addition, the stock market has rebounded significantly from its lows in March of 2009.

III. PROXY GROUP SELECTION

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

A. To develop a fair rate of return recommendation for KAWC, I have evaluated the return requirements of investors on the common stock of two proxy groups. These groups include a proxy group of water utility companies ("Water Proxy Group") and a proxy group of publicly-held gas distribution companies ("Gas Proxy Group").

Q. WHY HAVE YOU EMPLOYED THE RESULTS FOR A PROXY GROUP OF GAS DISTRIBUTION COMPANIES IN ADDITION TO YOUR WATER PROXY GROUP TO ESTIMATE AN EQUITY COST RATE FOR KAWC?

A. I have included an analysis of the results for the Gas Proxy Group in estimating an equity cost rate for KAWC for two reasons. First, the financial data needed to perform a DCF analysis for the Water Proxy Group is limited. For example, the *Value Line Investment Survey* provides projections for only three water companies. In addition, analysts' coverage of the water companies is also very

limited. On the other hand, there is better data available for the Gas Proxy Group to perform a DCF equity cost rate study. Second, the return requirements of investors on gas companies should be similar to that of water companies. Both industries are capital intensive and heavily regulated and provide for the distribution and delivery of an essential commodity whose service rates and rates of return are set by state regulatory commissions. In should be highlighted, however, that gas distribution companies do face the risk of substitution whereas water and wastewater companies do not.

Q. PLEASE DESCRIBE YOUR TWO PROXY GROUPS.

A. My Water Proxy Group consists of nine water utility companies that are covered by *AUS Utility Reports*. Summary financial statistics for the companies in this group are also listed in Exhibit JRW-4. The median operating revenues and net plant for the Water Proxy Group are $92.3M and $332.7M, respectively. The group receives 92% of revenues from regulated water operations, has a common equity ratio of 49.0%, and an earned return on common equity of 8.1%.

My Gas Proxy Group consists of nine natural gas distribution companies covered by the Standard Edition of the *Value Line Investment Survey*. Summary financial statistics for the group are listed in Exhibit JRW-4. The median operating revenues and net plant for the Gas Proxy Group are $1,872.7M and $2,317.5M, respectively. The group receives 63% of revenues from regulated gas operations, a common equity ratio of 52%, and an earned return on common equity of 10.5%.

On page 2 of Exhibit JRW-4, I have assessed the riskiness of the two groups using six different risk measures published by *Value Line*. These measures include Beta, Safety, Financial Strength, Stock Price Stability, Price Growth Persistence, and Earnings Predictability. Five of the six risk measures (lower Beta and higher Safety, Financial Strength, Stock Price Stability,and Earnings Predictability) suggest that the Gas Proxy Group is less risky than the Water Proxy Group. However, the magnitude of the differences in the risk metrics is not large. Nonetheless, these *Value Line* measures do suggest that that the Gas Proxy Group is a little less risky than the Water Proxy Group.

IV. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

Q. WHAT CAPITAL STRUCTURE RATIOS HAVE BEEN PROPOSED BY THE COMPANY?

A. Mr. Miller provides KAWC's proposed capital structure which is a 13-month average. As shown in Panel A of page 1 of Exhibit JRW-5, this capital structure consists of 2.315% short-term debt, 52.060% long-term debt, 1.652% preferred stock, and 43.973% common equity.

Q. ARE YOU EMPLOYING KAWC'S PROPOSED CAPITAL STRUCTURE IN DETERMINING YOUR OVERALL RATE OF RETURN?

A. Yes.

Q. WHAT DEBT COST RATES ARE YOU EMPLOYING?

A. The Company's proposed short-term debt cost rate is based on a projected Fed Funds rate of 1.70% plus a borrowing rate differential of .3847%. As shown on page 3 of Exhibit JRW-5, the current Fed Funds rate, and the target Fed Funds rate, is about .25%. I am using the current Fed Funds rate of .25%, which along with the Company's borrowing rate differential of .3847%, yields a short-term debt cost rate of .6347%.

My long-term debt cost rate is developed on page 4 of Exhibit JRW-5. I have adjusted the yield on the Company's proposed $25M, September 2010 financing. Mr. Miller used a rate of 6.663% based on a projected Treasury yield plus a 2.06% yield premium. I am using the average yield on thirty-year, BBB rated public utility bonds over the past month which is 5.90% (see Panel A of page 4 of Exhibit JRW-5). The resulting long-term debt cost rate, as developed in Panel B of page 4 of Exhibit JRW-5, is 6.32%.

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:[1]

> 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

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

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

As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio is relatively straightforward. A firm that 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:[2]

> 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.

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

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

To assess the relationship by industry, as suggested above, I have performed a regression study between estimated return on equity and market-to-book ratios using natural gas distribution, electric utility and water utility companies. I used all companies in these three industries which are covered by *Value Line* and which 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.[3] 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, BBB+, and BBB rated public utility bonds. These yields decreased from 2000 until 2003, hovered in the 5.50%-6.50% ranges from mid-2003 until mid-2008, spiked up to the 7.0% to

[3] 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.

8.0% range with onset of the financial crisis, remained high and volatile until mid-2009, and then have decreased to the 5.5% to 6.0% range.

Page 2 provides the dividend yields for the Water and Gas Proxy Groups over the past decade. The dividend yields for both groups peaked early in the decade. The Water Proxy Group yields decreased to 2.75% in 2007 and increased to almost 3.5% as of 2009. The Gas Proxy Group yields bottomed out at 3.75% in 2007, and have since increased to 4.25%.

Average earned returns on common equity and market-to-book ratios for the two groups are on page 3 of Exhibit JRW-7. For the Water Proxy Group, earned returns on common equity peaked early in the decade at 11.0%, Over the past five years, they have been in the 8.0% to 9.0% range. As of 2009, the average ROE for the group was about 8.0%. The average market-to-book ratios for this group have ranged from 1.5X to 2.3X. As of 2009, the market-to-book average was 1.75X. For the Gas Proxy Group, earned returns on common equity have been in the 10.0% to 12.0% range. The average ROE as of 2009 was 11.75%. Over the past decade, the average market-to-book ratios for this group have ranged from 1.50 to 1.80.

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 WATER UTILITY AND GAS DISTRIBUTION COMPANIES COMPARE WITH THAT OF OTHER INDUSTRIES?

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

Exhibit JRW-8 provides an assessment of investment risk for 100 industries as measured by beta, which according to modern capital market theory is the only relevant measure of investment risk. These betas come from the *Value Line Investment Survey* and are compiled annually by Aswath

Damodoran of New York University.[4] The study shows that the investment risk of utilities is very low. The average beta for electric, water, and natural gas utility companies are 0.75, 0.82, and 0.68, respectively. These are well below the *Value Line* average of 1.17. As such, the cost of equity for utilities is among the lowest of all industries in the U.S.

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

A. The costs of debt and preferred stock are normally based on historical or book values and can be determined with a great degree of accuracy. The cost of 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.

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

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. 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. <u>Discounted Cash Flow Analysis</u>

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 GROUPS?

A. The dividend yields on the common stock for the companies in the proxy groups are provided on page 2 of Exhibit JRW-10 for the six-month period ending June 2010. For the DCF dividend yields for the groups, I am using the median of the six month and June 2010 dividend yields. The table below shows these dividend yields.

	June 2010 Dividend Yield	Six Month Dividend Yield	DCF Dividend Yield
Water Proxy Group	**3.2%**	**3.3%**	**3.25%**
Gas Proxy Group	**4.2%**	**4.4%**	**4.30%**

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.[5]

[5] *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).

In applying the DCF model, some analysts adjust the current dividend for growth over the coming year as opposed to the coming quarter. This can be complicated because firms tend to announce changes in dividends at different times during the year. As such, the dividend yield computed based on presumed growth over the coming quarter as opposed to the coming year can be quite different. Consequently, it is common for analysts to adjust the dividend yield by some fraction of the long-term expected growth rate.

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

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 GROUPS?

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

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

A. Historical growth rates for EPS, DPS, and BVPS are readily available to virtually all investors and presumably an important ingredient in forming expectations concerning future growth. However, one must use historical growth numbers as measures of investors' expectations with caution. In some cases, past growth may not reflect future growth potential. Also, employing a single growth rate number (for example, for five or ten years), is unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e., business cycles). Thus, 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.

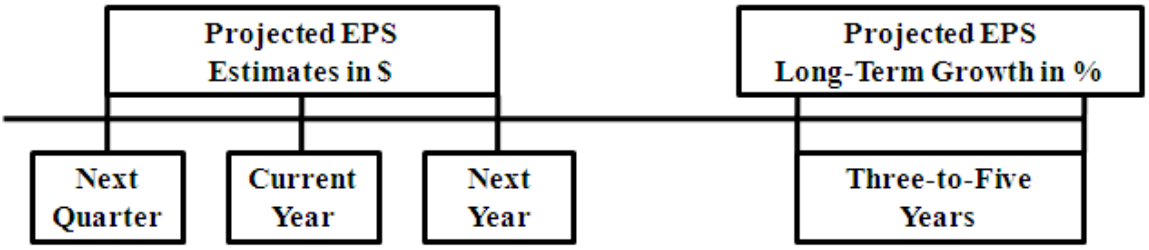
Internally or sustainable generated growth is a function of the percentage of earnings retained within the firm (the earnings retention rate) and the rate of return earned on those earnings (the return on equity). The internal growth rate is computed as the retention rate times the return on equity. 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 ANALYSTS' EPS FORECASTS.

A. EPS forecasts are collected and published by a number of different services, including by Zack's, First Call, I/B/E/S, and Reuters. These services retrieve and compile EPS forecasts from Wall Street analysts. These analysts come from both sell side financial firms such as Merrill Lynch and Morgan Stanley and buy side financial firms such as Prudential Insurance and Fidelity Investments.

These services collect and publish: (1) EPS estimates for future quarterly and annual time periods; and (2) long-term EPS growth rate forecasts. The EPS estimates are in dollars and cents per share, and the services report the high, low,

and mean of the estimates collected for analysts. The long-term projected EPS growth rate is expressed in percentage terms. As shown in the figure below, the projected EPS near-term estimates are usually provided for the next quarter, the current fiscal year, 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 American States Water Company ("AWR").

Consensus Earnings Estimates
American States Water Company
www.reuters.com
June 1, 2010

	# of Estimates	Mean	High	Low	1 Year Ago
Earnings (per share)					
Quarter Ending Jun-10	4	0.57	0.63	0.48	0.48
Quarter Ending Sep-10	4	0.55	0.61	0.47	0.64
Year Ending Dec-10	4	2.03	2.19	1.94	1.92
Year Ending Dec-11	4	2.17	2.25	2.10	--
LT Growth Rate (%)	2	4.00	4.00	4.00	7.00

These figures can be interpreted as follows. The top line shows that four analysts have provided EPS estimates for the quarter ending June 30, 2010. The mean, high, and low estimates are $0.57, $0.63, and $0.48. The second line shows the quarterly EPS estimates for the quarter ending September 30, 2010. Line three and four show the annual EPS estimates for the fiscal years ending December 2010 and 2011. These quarterly and annual EPS forecasts are expressed in dollars and cents. As in the AWR case shown here, it is common for more analysts to provide estimates of annual EPS as opposed to quarterly EPS. The long-term growth rate is expressed as a percent, and there are usually fewer analysts providing this figure. For AWR, two analysts have provided a long-term EPS growth rate forecast, and the mean, high, and low growth rates are all 4.0%.

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, 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. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate.

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.

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 downwards from the projected EPS growth rate to reflect the upward bias.

Q. PLEASE DISCUSS THE HISTORICAL GROWTH OF THE COMPANIES IN THE WATER AND GAS PROXY GROUPS.

A. Page 3 of Exhibit JRW-10 provides the 5- and 10- year compounded annual growth rates for the companies in the groups. Whereas I have presented the results using both mean and medians as measures of central tendency, due to the presence of outliers, I have used the median as a measure of central tendency in my analysis.[6]

Historical EPS for the Water Proxy Group growth is volatile, with a median range of 2.46%-3.77%. Historical DPS growth is steadier, with a median range of 2.56%-3.04%. Historical BVPS growth is higher, with a range of 5.07%-5.29%. Overall, the average of the 5-year and 10-year medians of historic EPS, DPS, and BVPS growth rates is 3.7%.

For the Gas Proxy Group, EPS growth has a 5-year and 10-year median range of 5.63%-6.03%. DPS growth is steadier and lower, with a median range of 1.91%-2.99%. The median range for BVPS is 4.54%-5.25%. Overall, the average of the 5-year and 10-year medians of historical EPS, DPS, and BVPS growth rates is 4.4%.

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

A. Historic growth rates for the companies in the groups, as published in the *Value Line Investment Survey*, are on page 4 of Exhibit JRW-10. For the Water Proxy Group, the data are very limited. The historical growth measures

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

in EPS, DPS, and BVPS, as measured by the medians, range from 1.5% to 5.8%, with an average of 3.7%. The range of the medians for the Gas Proxy Group is 2.0% to 6.5%, with an average of 4.3%.

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

A. *Value Line's* projections of EPS, DPS, and BVPS growth for the proxy groups are shown on page 5 of Exhibit JRW-10. As above, due to the presence of outliers, medians are used in the analysis. The projected *Value Line* data for the water companies are limited in that there are only three water companies with projections. For these three companies, the median range is from 3.0% to 6.5%, with an average of 4.3%. For the Gas Proxy Group, the median range is from 3.0% to 4.0%, with an average of 3.5%.

Also provided on page 5 of Exhibit JRW-10 is prospective sustainable growth for the proxy groups as measured by *Value Line*'s average projected retention rate and return on shareholders' equity. As noted above, sustainable growth is a primary driver of long-run earnings growth. For the Water Proxy Group, the median prospective sustainable growth rate for the three companies with data is 5.7%. The median prospective sustainable growth rate for the Gas Proxy Group is 4.7%.

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

A. Zacks, First Call and Reuters collect, summarize, and publish Wall Street analysts' 5-year EPS growth rate forecasts for the companies in the proxy groups. These forecasts for the companies in the proxy groups are on page 6 of Exhibit JRW-10. There is limited coverage of the companies in the Water Proxy Group. The medians of analysts' projected EPS growth rates for the Water and Gas Proxy Group 7.6% and 4.8%, respectively.[7]

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

A. The summary DCF growth rate indicators for the two proxy groups are on page 7 of Exhibit JRW-10. The data for the Gas Proxy Group are much more complete and provide a much better indication of expected growth and the DCF equity cost rate. *Value Line* only has projections for three of the companies in the Water Proxy Group, and analysts' EPS growth rate forecasts are only available for three of the nine companies from both Zack's and Reuters. In addition, in some cases where there is only one analyst provided an EPS growth rate estimate. Therefore, I am relying primarily on the DCF results for the Gas Proxy Group in arriving at an equity cost rate for the Company.

The historical growth rate figures for the Gas Proxy Group suggest a baseline growth rate in the 4.3% to 4.4% range for these companies.

[7] 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.

Sustainable and projected growth rates from *Value Line* are in the 3.5% to 4.7% range. Analysts projected EPS growth is 4.8%. The average of sustainable and projected growth rate indicators is 4.3%. Giving more weight to the projected and sustainable growth rate indicators, an expected DCF growth rate in the 4.5% range is reasonable for the group. I will use this figure as the DCF growth rate for the Gas Proxy Group.

The summary DCF growth rate indicators for the Water Proxy Group are also provided in the table. As noted above, the data for the Water Proxy Group is very limited while the data for Gas Proxy Group is more complete and provides a much better indicator of prospective growth. Therefore, my assessment of the expected growth for the Water Proxy Group is relative to the growth of the Gas Proxy Group. The historical growth rate indicators for the Water Proxy Group imply a baseline growth rate of 3.7%, which is below the Gas Proxy Group. The projected growth rate indicators for the Water Proxy Group, while very limited in number and more variable, are higher than those of the Gas Proxy Group. The average of the historic and projected growth rate indicators is 5.0%, and the average of the sustainable and projected EPS growth rates is 5.9%. Analysts' projected EPS growth for the companies in the Water Proxy Group is 7.6%. However, this figure is highly suspect due to the low number of observations. Given these growth rate measures, I believe that an expected growth rate of 100 to 200 basis points above the Gas Proxy Group is appropriate for the Water Proxy Group. I will use the midpoint of this range, 150 basis points, as the incremental growth of

the water group relative to the gas group. Therefore, I will use a DCF growth rate of 6.0% (4.50% + 1.50%) for the Water Proxy Group.

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

A. My DCF-derived equity cost rate for the groups 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
Water Proxy Group	**3.25%**	**1.03000**	**6.0%**	**9.3%**
Gas Proxy Group	**4.30%**	**1.02250**	**4.5%**	**8.9%**

C. Capital Asset Pricing Model Results

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

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

$$k = R_f + RP$$

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

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

$$K = (R_f) + ß * [E(R_m) - (R_f)]$$

Where:

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

To estimate the required return or cost of equity using the CAPM requires three inputs: the risk-free rate of interest (R_f), the beta (ß), and the expected equity or market risk premium $[E(R_m) - (R_f)]$. R_f is the easiest of the inputs to measure – it is the yield on long-term Treasury bonds. ß, the measure of systematic risk, is a little more difficult to measure because there are different opinions about what adjustments, if any, should be made to

historical betas due to their tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the expected equity or market risk premium ($E(R_m) - (R_f)$). I will discuss each of these inputs below.

Q. PLEASE DISCUSS EXHIBIT JRW-11.

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

Q. PLEASE DISCUSS THE RISK-FREE INTEREST RATE.

A. The yield on long-term U.S. Treasury bonds has usually been viewed as the risk-free rate of interest in the CAPM. The yield on long-term U.S. Treasury bonds, in turn, has been considered to be the yield on U.S. Treasury bonds with 30-year maturities. However, when the Treasury's issuance of 30-year bonds was interrupted for a period of time in recent years, the yield on 10-year U.S. Treasury bonds replaced the yield on 30-year U.S. Treasury bonds as the benchmark long-term Treasury rate. Ten-year Treasury yields began to decline in mid-2007 at the beginning of the financial crisis, and fell below 3.0% as the housing and sub-prime mortgage crises led to an overall credit crisis and economic recession. These rates bottomed out in December of 2008 and have increased since that time as prospects for an economic recovery have increased as can be seen on Panel A of page 2 of Exhibit JRW-11.

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

A. The U.S. Treasury began to issue the 30-year bond in the early 2000s as the U.S. budget deficit increased. The yield on 30-year Treasury bonds has been in the 4.0% to 4.75% range over the last several months. As of May 27, 2010, as shown on Panel B page 2 of Exhibit JRW-11, the rate on 30-year U.S. Treasury Bonds was 4.17%. Given the current and recent range of yields, I will use 4.25%, as the risk-free rate, or R_f, in my CAPM.

Q. WHAT BETAS ARE YOU EMPLOYING IN YOUR CAPM?

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

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

Numerous online investment information services, such as Yahoo! and Reuters, provide estimates of stock betas. Usually these services report different betas for the same stock. The differences are usually due to: (1) the time period over which the ß is measured; and (2) any adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In estimating an equity cost rate for the proxy group, I am using the betas for the companies as provided in the *Value Line Investment Survey*. As shown on page 3 of Exhibit JRW-11, the median betas for the companies in Water and Gas Proxy Groups are 0.75 and 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.[8] 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

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

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.[9]

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 600 CFOs participate in the survey.[10] Questions regarding expected stock and bond returns are also included in the Federal Reserve Bank of Philadelphia's annual survey of financial forecasters which is published as the *Survey of Professional Forecasters*.[11] 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.

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

[11] Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters,* (February 12, 2010). 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.

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

Page 5 of Exhibit JRW-11 provides a summary of the results of the primary risk premium studies reviewed by Derrig and Orr, Fernandez, and Song, 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 historic and ex ante models.

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

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

A. Page 5 of Exhibit JRW-11 provides a summary of the results of the equity risk premium studies that I have reviewed. These include the results of: (1) the various studies of the historical risk premium, (2) ex ante equity risk premium studies, (3) equity risk premium surveys of CFOs, Financial Forecasters, 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 4.38%.

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 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 published before January 2, 2010. The median for this subset of studies is 4.68%.

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

A. I am using the median equity risk premium for the 2010 studies and surveys, which is 4.68%.

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

A. Yes. In the previously referenced March June CFO survey conducted by *CFO Magazine* and Duke University, the expected 10-year equity risk premium was 3.65%.

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 7.27% and 4.52%, respectively. This provides an ex ante equity risk premium of 2.75%.

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 2010 survey of financial analysts and companies. This survey included 2,400 responses. The

median equity risk premium employed by both U.S. analysts and analysts was 5.0%.

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.[13]

Q. HAS MCKINSEY RECENTLY REAFFIRMED ITS OPINION ON THE EQUITY RISK PREMIUM IN LIGHT OF THE FINANCIAL CRISIS?

A. Yes. As previously discussed, McKinsey has recently published a study in which they reaffirm their estimate of the equity risk premium in light of the financial turmoil of the past two years.[14]

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

[14]Richard Dobbs, Bin Jang, and Timothy Koeller, "Why the Crisis Hasn't Shaken the Cost of Capital," *McKinsey Quarterly* (December 2008), p. 1-6.

Q. WHAT EQUITY COST RATES ARE 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
Water Proxy Group	**4.25%**	**0.75**	**4.68%**	**7.8%**
Gas Proxy Group	**4.25%**	**0.65**	**4.68%**	**7.3%**

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

D. Equity Cost Rate Summary

Q. PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.

A. The results for my DCF and CAPM analyses for the two proxy groups are indicated below:

	DCF	CAPM
Water Proxy Group	**9.3%**	**7.8%**
Gas Proxy Group	**8.9%**	**7.3%**

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

A. Given the results for the two proxy groups, I conclude that the appropriate equity cost rate for KAWC is in the 7.3% to 9.3% range. I give primary weight to the DCF results, and I believe that the DCF results for the Gas Proxy Group provide a much better indicator as to the equity cost rate for KAWC than the DCF results for the Water Proxy Group. Hence, it is my

opinion that the appropriate equity cost rate for KAWC is in 8.9% to 9.3% range. This range is certainly reasonable given the lower CAPM results for the two groups. Given these results and my earlier findings that water companies are riskier than gas companies, I will use 9.25%, as the equity cost rate for KAWC.

Q. WHY DO YOU BELIEVE THAT THE DCF RESULTS FOR THE GAS PROXY GROUP PROVIDE A BETTER INDICATION AS TO THE EQUITY COST RATE FOR KAWC THAN THE DCF RESULTS FOR THE WATER PROXY GROUP?

A. As noted above, the data for the Water proxy Group are very limited. In particular, there are only three companies with projected *Value Line* EPS, DPS, and BVPS growth rates, and there are very few analysts who cover the water companies. Also, the projected EPS growth rates are questionable because there is such a large difference between the historic growth rates of the water companies and the projected EPS growth rates of the few analysts who cover the water companies. And as I highlight in my testimony, it is well known that the projected EPS growth rates of Wall Street analysts are overly optimistic and upwardly biased. As a result, the DCF equity cost rate for the Water Proxy Group is very much dependent on the projected EPS growth rates of a few Wall Street analysts who have a tendency to be optimistic in their forecasts.

Q. DO YOU BELIEVE THAT YOUR 9.25% RECOMMENDATION IS CONSISTENT WITH THE AUTHORIZED RETURNS ON EQUITY FOR WATER COMPANIES?

A. Yes. Panel A of Exhibit JRW-12 provides the most recent authorized ROEs for the water companies as reported by *AUS Utilities Reports*. The average authorized return is 10.07%. In addition, Panel B of Exhibit JRW-12 provides the authorized ROEs for a broader group of small water companies as reported by the National Association of Water Companies in their most recent *Financial and Operating Data Report.* The average reported authorized return is 9.9%. Given the settling of the capital markets and the solid performance of water utility stocks during the financial crisis, I believe that my 9.25% ROE recommendation is consistent with the authorized ROEs for water companies.

VI. CRITIQUE OF KAWC'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE KAWC'S RATE OF RETURN REQUEST FOR KAWC.

A. KAWC's cost of capital request is provided on page 1 of Exhibit JRW-13. The company is requesting a capital structure from investor sources consisting of 2.315% short-term debt, 52.06% long-term debt, 1.652% preferred stock, and 43.973% common equity. The Company uses short-term debt, long-term debt and preferred stock cost rates of 2.085%, 6.41%, and 7.75% and an equity cost rate of 11.50%.

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

A. Yes. I have issues with the Company's short-term and long-term debt cost rates, and most significantly, the equity cost rate. The debt cost rates were previously discussed. I will focus below on Dr. Vander Weide's equity cost rate of 11.50%.

A. Equity Cost Rate

Q. PLEASE REVIEW DR. VANDER WEIDE'S EQUITY COST RATE APPROACHES.

A. Dr. Vander Weide estimates an equity cost rate for KAWC using the results for two proxy groups and employs DCF, RP, and CAPM equity cost rate approaches.

Q. PLEASE SUMMARIZE DR. VANDER WEIDE'S EQUITY COST RATE RESULTS.

A. Dr. Vander Weide's equity cost rate estimates for KAWC are summarized in Panel A of page 2 of Exhibit JRW-13. Based on these figures, he concludes that the appropriate equity cost rate is in the range of 10.8% to 12.1%. The Company has used 11.5% as an equity cost rate in its rate filing.

Q. PLEASE DISCUSS YOUR ISSUES WITH DR. VANDER WEIDE'S REQUESTED EQUITY COST RATE.

A. Dr. Vander Weide's requested return on common equity is too high primarily due to: (1) the use of several inappropriate companies in his water and gas groups; (2) the full-year adjustment to the dividend yield in his DCF approach; (3) an inflated growth rate in his DCF approach; (4) excessive equity risk premiums in his RP and CAPM approaches; (5) he has ignored his CAPM equity cost rate results; and (6) unwarranted flotation cost adjustments to his equity cost rate results.

1. Proxy Groups

Q. PLEASE REVIEW DR. VANDER WEIDE'S WATER GROUP.

A. Dr. Vander Weide has used a group of eleven water companies and a proxy group of twelve gas distribution companies. Most of the companies in his water group are also in my Water Proxy Group. I have excluded two of the companies used by Dr. Vander Weide. I have excluded American Water Works ("AWW") because: (1) the AWW has been a public company for less than two years and paid a dividend for one and one-half years; and (2) its historical and projected financial results are distorted because of AWW's recovery from its ownership by RWE AG. I have also not used Southwest Water because of: (1) its severe financial problems over the past two years, including a dividend cut in 2009; and (2) the company has agreed to be sold to an investor group.

There are much more serious issues with Dr. Vander Weide twelve

company gas group. In particular, I have identified six of the twelve companies that have a low percentage of revenues coming from the regulated gas distribution business, and/or are engaged in riskier businesses. The business activities of these six companies – Energen, EQT, MDU Resources, NiSource, ONEOK, and Questar - are listed on page 3 of Exhibit JRW-13. On page 4 of Exhibit JRW-13 I have provided a financial comparison of these six companies (Panel A - Primarily Non- Regulated Gas Companies), the other six companies in his gas group (Panel B - Primarily Regulated Gas Companies), and my group of water companies (Panel C – Water Proxy Group). The median percent of regulated gas revenues of the group of Primarily Non-Regulated Gas Companies is only 30%, compared to 81% for the Primarily Regulated Gas Companies. For the Water Proxy Group, the median percentage of regulated water revenues is 92%. The group of Primarily Non-Regulated Gas Companies is clearly riskier. The average bond rating is BBB, versus A for the Primarily Regulated Gas Companies and the Water Proxy Group. In addition, the risk of these companies as indicated by beta is much higher. The median beta for the Primarily Non-Regulated Gas Companies Group is 1.08, versus 0.70 for the Primarily Regulated Gas Companies Group and 0.75 for the Water Proxy Group. Therefore, the results for Dr. Vander Weide's gas group should be ignored. This group has a number of companies with significant non-regulated gas activities and is riskier than regulated water and gas companies

2. DCF Approach

Q. PLEASE SUMMARIZE DR. VANDER WEIDE'S DCF ESTIMATES.

A. On pages 12-29 of his testimony and his Exhibit No. ___(JVW-1) – Schedules 1 and 2, Dr. Vander Weide develops an equity cost rate by applying a DCF model to his groups of water and gas companies. In the traditional DCF approach, the equity cost rate is the sum of the dividend yield and expected growth. Dr. Vander Weide makes adjustments to the dividend yield to reflect the quarterly payment of dividends. Dr. Vander Weide uses one measure of DCF expected growth - the projected EPS growth rate. He averages the EPS growth rate forecasts from (1) Wall Street analysts as provided by IBES and (2) *Value Line*. He includes a flotation cost adjustment of five percent. Dr. Vander Weide's DCF results are provided in Panel B of page 2 of Exhibit JRW-13. Based on these figures, Dr. Vander Weide claims that the DCF equity cost rate for the water and gas groups are 12.1% and 11.4%, respectively.

Q. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S DCF ANALYSES?

A. There are three errors: (1) some of the companies in the proxy companies are not good proxies for KAWC; (2) the quarterly dividend yield adjustment is excessive; (3) the projected DCF growth rate is based entirely on the overstated and upwardly biased EPS growth rate estimates of Wall Street analysts and

Value Line; and (4) the flotation cost adjustment is inappropriate. The proxy groups issue was addressed above. The other issues are discussed below.

DCF Dividend Yield Adjustment

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

A. Dr. Vander Weide uses DCF dividend yields of 4.1% for the water group and 4.6% for the gas group. In Appendix 2 of his testimony, Dr. Vander Weide discusses the adjustments he makes to his spot dividend yields to account for the quarterly payment of dividends. This includes an adjustment to reflect the time value of money. The quarterly timing adjustment is in error and results in an overstated equity cost rate. First, as above, the appropriate dividend yield adjustment for growth in the DCF model is the expected dividend for the next quarter multiplied by four. The quarterly adjustment procedure is inconsistent with this approach.

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

generates its own compounding, but it is outside of the dividend payments of the issuing company. Dr. Vander Weide's approach serves to duplicate this compounding process, thereby inflating the return to the investor. Finally, the notion that an adjustment is required to reflect the quarterly timing issue is refuted in a study by Richard Bower of Dartmouth College.

Bower acknowledges the timing issue and downward bias addressed by Dr. Vander Weide. However, he demonstrates that this does not result in a biased required rate of return. He provides the following assessment:[15]

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

He also makes the following observation on the issue:

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

DCF Growth Rate

Q. PLEASE REVIEW DR. VANDER WEIDE'S DCF GROWTH RATE.

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

A. Dr. Vander Weide DCF growth rate is the average of the projected EPS growth rate forecasts: (1) Wall Street analysts as compiled by IBES; and (2) *Value Line*. Dr. Vander Weide employs DCF growth rates of 8.0% for the water group and 6.8% for the gas group.

Q. PLEASE DISCUSS THE ERROR IN DR. VANDER WEIDE'S DCF GROWTH RATE.

A. First, it should be noted that the projected growth rate data for the companies in the water group is so limited that you cannot give much these results much weight is estimating a DCF equity cost rate for KAWC. In addition, as noted above, there are a number of companies in the gas group that are riskier than water companies. Hence, Dr. Vander Weide's results for this group are also tainted. The other primary problem is that Dr. Vander Weide has relied exclusively on the EPS growth rate forecasts of Wall Street analysts and *Value Line*.

Q. WHY IS IT ERRONEOUS TO RELY EXCLUSIVELY ON THE EPS FORECASTS OF WALL STREET ANALYSTS IN ARRIVING AT A DCF GROWTH RATE?

A. There are several issues with using the EPS growth rate forecasts of Wall Street analysts and *Value Line* as DCF growth rates. First, the appropriate growth rate in the DCF model is the dividend growth rate, not the earnings growth rate. Therefore, in my opinion, consideration must be given to other indicators of growth, including prospective dividend growth, internal growth, as well as projected earnings growth. Second, and most significantly, it is

well-known that the 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. In addition, I demonstrate that *Value Line*'s EPS growth rate forecasts are consistently too high. Hence, using these growth rates as a DCF growth rate will provide an overstated equity cost rate.

Q. PLEASE REVIEW THE ACADEMIC RESEARCH ON THE ACCURACY OF ANALYSTS' NEAR-TERM EPS ESTIMATES AND LONG-TERM EPS GROWTH RATE FORECASTS.

A. 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 the early studies evaluated the accuracy of earnings forecasts for the next quarter or the next year. These studies document that analysts make overly optimistic EPS earnings forecasts (Stickel, 1990; Brown, 1997; Chopra, 1998).[16] Harris (1999) published the first study examining the accuracy of long-term EPS growth rate forecasts.[17] He evaluated the accuracy of analysts' long-term EPS forecasts over the 1982-1997 time period. He concluded the following: (1) the accuracy of analysts' long-term EPS forecasts is very low; (2) a superior long-run method to forecast that all companies will have an earnings growth rate equal to historic GDP growth; and (3) analysts' long-term EPS forecasts

[16] 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.

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

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 conclude that analysts' long-term EPS growth rate forecasts are overly optimistic and upwardly biased.[18]

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, P (2004) report that the upward bias in earnings growth rates declines in the quarters leading up to the earnings announcement date.[19] 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 earnings announcement date.

In sum, there have been many studies of analysts' earnings forecasts. The studies conclude (almost unanimously) that analysts' earnings forecasts of short-term earnings estimates and long-term earnings growth rates are overly optimistic. In terms of analysts' projections long-term earnings growth, all previous studies have come to this conclusion.

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[18] 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. (2003). The Level and Persistence of Growth Rates, "*Journal of Finance* (2003) 58, pp. 643−684.

[19] 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*, (2004), pp. 885−924.

Q. PLEASE DISCUSS YOUR STUDY OF THE ACCURACY OF ANALYSTS' LONG-TERM EARNINGS GROWTH RATES.

A. 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-14, 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 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-14, 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-14. 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 hovered in the 14.5%-17.5% range until 1995 and then increased dramatically over the next five years to 23.3% in the fourth quarter of the year 2000. Forecasted EPS growth has since declined to the 15.0% range.

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

A. Yes. Page 2 of Exhibit JRW-14 provides an article published in the *Wall Street Journal*, dated March 21, 2008, that discusses the upward bias in analysts' EPS growth rate forecasts.

Q. PLEASE ADDRESS THE ISSUE REGARDING THE SUPERIORITY OF ANALYSTS' EPS FORECASTS OVER HISTORIC AND TIME-SERIES ESTIMATES OF EPS GROWTH?

A. 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.[20] This is often attributed to the information and timing advantage that analysts have over historic and time-series analyses. However, more recently Bradshaw, Drake, Myers, and Myers (2009) discovered that time-series estimates of annual earnings are 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."[21]

With respect to long-term earnings growth, analysts' forecasts of long-term growth have not been found to be superior to other historic growth rate measures. Harris (1999) concluded that historic GDP growth was superior to analysts' forecasts for long run earnings growth. These results are supported by empirical results of Chan, Karceski, and Lakonishok (2003).

Q. WHAT IMPACT HAS NEW STOCK MARKET AND REGULATORY DEVELOPMENTS HAD ON ANALYSTS' EPS GROWTH RATE FORECASTS?

A. Analysts' EPS growth rate forecasts have subsided somewhat since the stock market peak of 2000. Two regulatory developments over the past decade have potentially impacted analysts EPS growth rate estimates. First,

[20] 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.
[21] 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.

Regulation Fair Disclosure ("Reg FD") was introduced by the 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 analysts operations was addressed in the Global Analysts Research Settlements ("GARS"). GARS, as agreed upon on April 23, 2003 between the SEC, NASD, NYSE and ten of the largest U.S. investment firms, includes a number of regulations that were introduced to prevent investment bankers from pressuring analysts to provide favorable projections.

The impact of these regulatory developments on the accuracy of short-term EPS estimates was addressed in a recent study by Hovakimian and Saenyasiri (2009).[22] They 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);[23] 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

[22] A. Hovakimian and E. Saenyasiri, "Conflicts of Interest and Analysts Behavior: Evidence from Recent Changes in Regulation," Working Paper, April 20, 2009 (SSRN No, 1133102).

[23] 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.

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). 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 has a small positive bias.

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. 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:

> Hope springs eternal, says Mark Donovan, who manages Boston Partners Large Cap Value Fund. "You would have thought that, given what happened in the

> last three years, people would have given up the ghost. But in large measure they have not."
>
> These overly optimistic growth estimates also show that, even with all the regulatory focus on too-bullish analysts allegedly influenced by their firms' investment-banking relationships, a lot of things haven't changed. Research remains rosy and many believe it always will.[24]

Q. ARE THESE OBSERVATIONS CONSISTENT WITH THE FINDINGS OF A RECENT MCKINSEY STUDY ON THE IMPACT OF THESE REGULATIONS ON THE ACCURACY OF ANALYSTS' EPS GROWTH RATE FORECASTS?

A. Yes. McKinsey recently published a study entitled "Equity Analysts: Still too Bullish" in which they reported on a study of the accuracy on analysts long-term EPS growth rate forecasts. They concluded that after a decade of stricter regulation, analysts' earnings long-term earnings forecasts continue to be excessively optimistic.

They made the following observation: [25]

> 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

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

[25] Marc H. Goedhart, Rishi Raj, and Abhishek Saxena, Equity Analysts, Still Too Bullish," McKinsey on Finance (Spring 2010), pp. 14-17).

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 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.

Q. ARE ANALYSTS' EPS GROWTH RATE FORECASTS LIKEWISE UPWARDLY BIASED FOR UTILITY COMPANIES?

A. Yes. 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 3 of Exhibit JRW-14. The projected EPS growth rates for electric utilities have been in the four to six percent range over the last twenty years, with the recent figures approximately five percent. 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 six percent in the 1990s to about five percent 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.

Q. ARE *VALUE LINE*'S GROWTH RATE FORECASTS OVERLY OPTIMISTIC?

A. Yes. *Value Line* has a decidedly positive bias to its earnings growth rate forecasts as well. To assess *Value Line*'s earnings growth rate forecasts, I used the *Value Line Investment Analyzer*. The results are summarized in Panel A of Page 4 of Exhibit JRW-14. I initially filtered the database and found that *Value Line* has 3-5 year EPS growth rate forecasts for 2,339 firms. The average projected EPS growth rate was 12.00%. 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 114 companies. This is less than five 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 2,139 companies. The results are shown in Panel B of page 4 of Exhibit JRW-14 and indicate that the average 5-year historic growth rate was 11.53%, and *Value Line* reported negative historic growth for 515 firms which represents 24.06% 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.

Q. DR. VANDER WEIDE HAS DEFENDED THE USE OF ANALYSTS' EPS FORECASTS IN HIS DCF MODEL BY CITING A STUDY HE PUBLISHED WITH DR. WILLARD CARLETON. PLEASE DISCUSS DR. VANDER WEIDE'S STUDY.

A. Dr. Vander Weide cites the study on pages 18-19 of his testimony. In the study, Dr. Vander Weide performs a linear regression of a company's stock price to earnings ratio (P/E) on the dividend yield payout ratio (D/E), alternative measures of growth (g), and three measures of risk (beta, covariance, r-squared, and the standard deviation of analysts' growth rate projections). He performed the study for three one-year periods – 1981-1982, and 1983 – and used a sample of approximately 65 companies. His results indicated that regressions measuring growth as analysts' forecasted EPS growth were more statistically significant that those using various historic measures of growth. Consequently, he concluded that analysts' growth rates are superior measures of expected growth.

Q. PLEASE CRITIQUE DR. VANDER WEIDE'S STUDY.

A. Before highlighting the errors in the study, it is important to note that the study was published twenty years ago, used a sample of only sixty five companies, and evaluated a three-year time period (1981-83) that was over

twenty-five years ago. Since that time, many more exhaustive studies have been performed using significantly larger data bases and, from these studies, much has been learned about Wall Street analysts and their stock recommendations and earnings forecasts. Nonetheless, there are several errors that invalidate the results of the study.

Q. PLEASE DESCRIBE THE ERRORS IN DR. VANDER WEIDE'S STUDY.

A. The primary error in the study is that his regression model is misspecified. As a result, he cannot conclude whether one growth rate measure is better than the other. The misspecification results from the fact that Dr. Vander Weide did not actually employ a modified version of the DCF model. Instead, he used a "linear approximation." He used the approximation so that he did not have to measure k, investors' required return, directly, but instead he used some proxy variables for risk. The error in this approach is there can be an interaction between growth (g) and investors' required return (k) which could lead him to conclude that one growth rate measure is superior to others. Furthermore, due to this problem, analysts' EPS forecasts could be upwardly biased and still appear to provide better measures of expected growth.

There are other errors in the study as well that further invalidate the results. Dr. Vander Weide does not use both historic and analysts' projections growth rate measures in the same regression to assess if both historic and forecasts should be used together to measure expected growth. In addition, he

did not perform any tests to determine if the difference between historic and projected growth measures is statistically significant. Without such tests, he cannot make any conclusions about the superiority of one measure versus the other.

Flotation Costs

Q. PLEASE DISCUSS DR. VANDER WEIDE'S ADJUSTMENT FOR FLOTATION COSTS.

A. Dr. Vander Weide claims that an upward adjustment to the equity cost rate is necessary 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 water utility companies are over 1.0X 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 water 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, electric utility companies are selling at market prices well in excess of book value. Hence, when new shares are sold, existing shareholders realize an increase in the book value per share of their investment, not a decrease;

(3) Flotation costs consist primarily of the underwriting spread or fee and not out-of-pocket expenses. On a per share basis, the underwriting spread is the difference between the price the investment banker receives from investors and the price the investment banker pays to the company. Hence, these are not expenses that must be recovered through the regulatory process. Furthermore, the underwriting spread is known to the investors who are buying the new issue of stock, who are well aware of the difference between

the price they are paying to buy the stock and the price that the Company is receiving. The offering price which they pay is what matters when investors decide to buy a stock based on its expected return and risk prospects. Therefore, the company is not entitled to an adjustment to the allowed return to account for those costs; and

(4) Flotation costs, in the form of the underwriting spread, are a form of a transaction cost in the market. They represent the difference between the price paid by investors and the amount received by the issuing company. Whereas 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.

3. Risk Premium ("RP") Approach

Q. PLEASE REVIEW DR. VANDER WEIDE'S RP ANALYSIS.

A. Dr. Vander Weide develops an equity cost rate using expected (ex ante) and a historical RP models. Dr. Vander Weide's RP results are provided in Panels C and D of page 2 of Exhibit JRW-13**.** In his expected RP approach, Dr. Vander

Weide computes an expected stock return by applying the DCF model to the S&P utilities and the S&P 500 and uses the EPS growth rate forecasts of Wall Street analysts as his growth rate. He then subtracts the yield on 'A' rated utility bonds. In his historic RP model, Dr. Vander Weide's computes a historical risk premium as the difference in the arithmetic mean stock and bond returns. The stock returns are computed for different time periods for several different indexes, including S&P and Moody's electric utility indexes as well as the S&P 500.

Q. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S RP ANALYSES?

A. The errors in Dr. Vander Weide's RP equity cost rate approaches include: (1) an inflated base interest rate; (2) an excessive risk premium which is based on the historical relationship between stock and bond returns; and (3) the inclusion of flotation costs. The flotation cost issue has already been addressed. The other two issues are discussed below.

Q. PLEASE DISCUSS THE BASE YIELD OF DR. VANDER WEIDE'S RISK PREMIUM ANALYSIS.

A. The base yield in Dr. Vander Weide's RP analysis is the projected yield on 'A' rated utility bonds. There are two issues with his projected 6.30% 'A' rated utility bond yield. First, the yield is above current market rates. As shown on Page 1 of Exhibit JRW-3, the current yield on long-term, 'A' rated public utility bonds is below 6.0%. Second, Vander Weide's base yield is erroneous

and inflates the required return on equity in two ways. First, long-term bonds are subject to interest rate risk, a risk which does not affect common stockholders since dividend payments (unlike bond interest payments) are not fixed but tend to increase over time. Second, the base yield in Dr. Vander Weide's risk premium study is subject to credit risk since it is not default risk-free like an obligation of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and therefore is above its expected return. Hence using such a bond's yield-to-maturity as a base yield results in an overstatement of investors' return expectations.

Q. DR. VANDER WEIDE EMPLOYS A DCF-BASED EX ANTE RISK PREMIUM APPROACH. PLEASE DISCUSS THE ERRORS IN THIS APPROACH.

A. Dr. Vander Weide computes a DCF-based equity risk premium. Dr. Vander Weide estimates an expected return using the DCF model and subtracts a concurrent measure of interest rates. The expected return is computed for utilities using the DCF model with analysts' EPS growth rate forecasts for the growth rate. Then Dr. Vander Weide employs 'A' rated utility yields as a measure of interest rates.

The primary error in this approach is the DCF-based or ex ante risk premium. This ex ante risk premium uses of the EPS growth rate forecasts of Wall Street analysts as the one and only measure of growth in the DCF model. This issue was addressed above. In short, as I discuss and demonstrate above,

analysts' EPS growth rate forecasts are upwardly biased estimates of actual EPS growth for companies in general as well as for electric utilities.

Q. PLEASE REVIEW DR. VANDER WEIDE'S EX POST OR HISTORIC RP STUDY.

A. Dr. Vander Weide performs an ex-post or historical RP study that appears in Schedules 4 and 5 of Exhibit__(JVW-1). This study involves an assessment of the historical differences between S&P Public Utility Index and the S&P 500 stock returns and public utility bond returns over various time periods between the years 1937-2008. From the results of his study, he concludes that an appropriate risk premium is 4.30%.

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

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

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

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

(A) Biased historical bond returns;

(B) The arithmetic versus the geometric mean return;

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

(D) Unattainable and biased historical stock returns;

(E) Company survivorship bias; and

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

Biased Historical Bond Returns

Q. HOW ARE HISTORICAL BOND RETURNS BIASED?

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

The Arithmetic versus the Geometric Mean Return

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

A. The measure of investment return has a significant effect on the interpretation of the risk premium results. When analyzing a single security price series over time (i.e., a time series), the best measure of investment performance is the geometric mean return. Using the arithmetic mean overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following observation: "The geometric mean measures the changes in wealth over more than one period on a buy and hold (with dividends invested) strategy."[26] Since Dr. Vander Weide's study covers more than one period (and he assumes that dividends are reinvested), he should be employing the geometric mean and not the arithmetic mean.

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

A. To demonstrate the upward bias of the arithmetic mean, consider the following example. Assume that you have a stock (that pays no dividend) that

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

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

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

The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return is the appropriate return measure. For this reason, when stock returns and earnings growth rates are reported in the financial press, they are generally reported using the geometric mean. This is because of the upward bias of the arithmetic mean. As further evidence of the appropriate mean return measure, the U.S. Securities and Exchange Commission requires equity mutual funds to report historic return performance using geometric mean and not arithmetic mean returns.[27] Therefore, Dr. Vander Weide's arithmetic mean return measures are biased and should be disregarded.

<u>The Error in Measuring Equity Risk Premiums with Historic Data</u>

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

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

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

Unattainable and Biased Historic Stock Returns

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

A. Returns developed using Ibbotson's methodology are computed on stock indexes and therefore (1) cannot be reflective of expectations because these returns are unattainable to investors and (2) produce biased results. This methodology assumes: (a) monthly portfolio rebalancing and (b) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors rebalance their portfolios at the end of each month in order to have an equal dollar amount

invested in each security at the beginning of each month. The assumption 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.[28]

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.

Company Survivorship Bias

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

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

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

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

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

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

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

A. Yes. Jay Ritter, a Professor of Finance at the University of Florida, identified the use of historical stock and bond return data to estimate a forward-looking equity risk premium as one of the "Biggest Mistakes" taught by the finance profession.[29] 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.

3. CAPM Approach

Q. PLEASE DISCUSS DR. VANDER WEIDE'S CAPM.

A. Dr. Vander Weide's CAPM results are provided in Panels E and F of page 2 of Exhibit JRW-13. Based on these figures, Dr. Vander Weide estimates an equity cost rate for KAWC of 9.64% using his historical CAPM and 11.02% using his expected CAPM approach.

Q. WHAT ARE THE ERRORS IN DR. VANDER WEIDE'S CAPM ANALYSIS?

A. First and foremost, Dr. Vander Weide has ignored the results of his CAPM analyses. In addition, there are several flaws with Dr. Vander Weide's CAPM: (1) his risk-free rate of 4.7%; (2) the historic and expected equity risk premiums; and (3) the flotation cost adjustment.

Q. PLEASE DISCUSS DR. VANDER WEIDE'S RISK-FREE RATE OF

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

INTEREST IN HIS CAPM.

A. Dr. Vander Weide uses a risk-free rate of interest of 4.7% in his CAPM. As previously discussed, the current rate on long-term Treasury bonds is 4.17%.

Q. PLEASE ADDRESS THE PROBLEMS WITH DR. VANDER WEIDE'S HISTORIC CAPM.

A. Dr. Vander Weide historical CAPM uses an equity risk premium of 6.5% which is based on the difference between the arithmetic mean stock and bond income returns over the 1926-2009 period. The errors associated with computing an expected equity risk premium using historical stock and bond returns were addressed at length earlier in my testimony. In short, there are a myriad of empirical problems, which result in historical market returns producing inflated estimates of expected risk premiums. Among the errors are the U.S. stock market survivorship bias (the 'Peso Problem'), the company survivorship bias (only successful companies survive – poor companies do not survive), and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). In addition, in this case, Dr. Vander Weide has compounded the error by using the bond income return and not the actual bond return. By omitting the price change component of the bond return, he has magnified the historic risk premium by not matching the returns on stock with the actual returns on bonds.

Q. PLEASE REVIEW THE ERRORS IN DR. VANDER WEIDE'S EQUITY OR MARKET RISK PREMIUM IN HIS EXPECTED CAPM APPROACH.

A. Dr. Vander Weide develops an expected equity risk premium for his CAPM of 8.4% in Schedule 8 of Exhibit__JVW-1) by applying the DCF model to the S&P 500. Dr. Vander Weide estimates an expected market return of 13.1% using a dividend yield of 2.4% and an expected DCF growth rate of 10.7. There are two errors with this approach. First, the published dividend yield for the S&P 500 is only 1.9%. Hence, Dr. Vander Weide's calculated expected return is inflated and incorrect. Second, and most significantly, the expected DCF growth rate is the projected 5-year EPS growth rate for the companies in the S&P 500 as reported by IBES. As explained below, this produces an overstated expected market return and equity risk premium.

Q. WHAT EVIDENCE CAN YOU PROVIDE THAT DR. VANDER WEIDE'S S&P 500 GROWTH RATE IS ERRONEOUS?

A. Dr. Vander Weide's expected S&P 500 growth rate of 10.7% 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 was detailed at length earlier in my testimony. Further, a long-term growth rate of 10.7% is inconsistent with economic and earnings growth in the U.S. The long-term economic and earnings growth rate in the U.S. has only been about 7%. I have performed a study of the growth in nominal GDP, S&P 500 stock price appreciation, and S&P 500 EPS and DPS growth since 1960. The results are

provided on page 1 of Exhibit JRW-15, and a summary is given in the table below.

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

Nominal GDP	**6.96%**
S&P 500 Stock Price Appreciation	**6.21%**
S&P 500 EPS	**6.22%**
S&P 500 DPS	**5.07%**
Average	**6.12%**

These results offer compelling evidence that a long-run growth rate in the 6% to 7% range is appropriate for companies in the U.S. By comparison, Dr. Vander Weide's long-run growth rate projection of 10.7% is overstated. These estimates suggest that companies in the U.S. would be expected to: (1) increase their growth rate of EPS by over 50% in the future and (2) maintain that growth indefinitely in an economy that is expected to grow at about one half of his projected growth rates. Such a scenario is not economically feasible and is directly attributable to Dr. Vander Weide's use of the upwardly biased EPS growth rate forecasts of Wall Street analysts.

Q. PLEASE EVALUATE DR. VANDER WEIDE'S OBSERVATION THAT THE CAPM UNDERSTATES THE EQUITY COST RATE DUE TO A COMPANY'S SIZE.

A. Dr. Vander Weide claims that an adjustment is required for the size of a company when using the CAPM to estimate an equity cost rate. This adjustment is based on the historical stock market returns studies as performed

and published by Ibbotson Associates. This argument is erroneous for several reasons.

First, as previously discussed, there are numerous errors in using historical market returns to compute risk premiums. These errors provide inflated estimates of expected risk premiums. Among the errors are the well-known survivorship bias (only successful companies survive – poor companies do not survive) and unattainable return bias (the Ibbotson procedure presumes monthly portfolio rebalancing). The net result is that Ibbotson's size premiums are poor measures for any risk adjustment to account for the size of the Company.

Second, 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.[30] As explained by Professor Wong, there are several reasons why such a size premium would not be attributable to utilities. Utilities are regulated closely by state and federal agencies and commissions and hence, their financial performance is monitored on an ongoing basis by both the state and federal governments. In addition, public utilities must gain approval from government entities for common financial transactions such as the sale of securities. Furthermore, unlike their industrial counterparts, accounting standards and reporting are fairly standardized for public utilities. Finally, a utility's earnings are predetermined to a certain degree through the ratemaking process in

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

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 a number of 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 historic return premium for small companies disappears once biases are eliminated and historic returns are properly computed. The error arises from the assumption of monthly portfolio rebalancing and the serial correlation in historic small firm returns.[31]

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 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

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

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:[32]

> 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.

Q. PLEASE PROVIDE A SUMMARY ASSESSMENT OF DR. VANDER WEIDE'S CAPM EQUITY RISK PREMIUMS.

A. Dr. Vander Weide's equity risk premiums are inflated due to errors and bias in his studies. In addition, they do not reflect the equity risk premiums that are used in the real worlds of finance. Investment banks, consulting firms, companies, financial analysts and CFOs use the equity risk premium concept every day in making financing, investment, and valuation decisions. I have provided the results of recent surveys of these financial professionals, and their equity risk premium estimates are in the 4% to 5% range and not in the 6% to 9% range. On this issue, the opinions of CFOs are especially relevant. CFOs deal with capital markets on an ongoing basis since they must continually assess and evaluate capital costs for their companies. They are well aware of the historical equity risk premium results as published by Ibbotson Associates

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

as well as Wall Street analysts' projections. Nonetheless, the CFOs in the June 2010 *CFO Magazine* – Duke University Survey of almost 500 CFOs shows an expected equity risk premium of 3.65% over the next ten years. In addition, surveys conducted in 2010 by Fernandez indicates that financial analysts and companies are using equity risk premiums of 5.0%. As such, using these real world equity risk premiums, the appropriate equity cost rate for a public utility should be in the 9.25% range and not in the 10.8% to 12.1% range.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.