COMMONWEALTH OF KENTUCKY

BEFORE THE

PUBLIC SERVICE COMMISSION

IN THE MATTER OF:)
)
ADJUSTMENT OF THE RATES OF   ) CASE NO. 2004-00103
KENTUCKY AMERICAN WATER COMPANY   )

DIRECT TESTIMONY

OF

DR. J. RANDALL WOOLRIDGE

August, 2004

KENTUCKY AMERICAN WATER COMPANY
Case No. 2004-00103

Direct Testimony of
Dr. J. Randall Woolridge

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

2 A. My name is J. Randall Woolridge and my business address is 120 Haymaker Circle, State

3 College, PA 16801. I am a Professor of Finance and the Goldman, Sachs & Co. and Frank P.

4 Smeal Endowed University Fellow in Business Administration at the University Park Campus of

5 the Pennsylvania State University. I am also the Director of the Smeal College Trading Room. In

6 addition, I am affiliated with the Columbia Group Inc., a public utility consulting firm based in

7 Georgetown, CT. A summary of my educational background, research, and related business

8 experience is provided in Appendix A.

9

I. SUBJECT OF TESTIMONY AND

10

SUMMARY OF RECOMMENDATIONS

11

12

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

14 A. I have been asked by the Kentucky Office of Attorney General to provide an opinion as to

15 the overall fair rate of return or cost of capital for Kentucky American Water Company ("KAWC"

16 or "Company") and to evaluate KAWC's rate of return testimony in this proceeding.

17 **Q. PLEASE REVIEW YOUR COST OF CAPITAL RETURN FINDINGS.**

18 A. I have independently arrived at a cost of capital for the Company. I have established an

19 equity cost rate of 8.75% for KAWC primarily by applying the Discounted Cash Flow ("DCF")

20 approach to two groups of publicly-held water service companies. I have also performed a Capital

21 Asset Pricing Model ("CAPM") study. Utilizing my equity cost rate, capital structure ratios, and

22 senior capital cost rates, I am recommending an overall fair rate of return for the Company of

1   7.11%. This recommendation is summarized in Exhibit_(JRW-1).

2   **Q.   PLEASE SUMMARIZE YOUR ASSESSMENT OF THE COMPANY'S RATE OF**

3   **RETURN POSITION.**

4   A.   The Company's rate of return testimony is offered by Mr. Michael A. Miller and Dr. James

5   H. Vander Weide. Mr. Miller provides a recommended capital structure, senior capital cost rates,

6   and overall rate of return. Dr. Vander Weide provides a recommended return on equity that is used

7   by Mr. Miller in his overall rate of return recommendation. The Company's proposed rate of return

8   is inflated due to an inappropriate capital structure and an overstated equity cost rate. The proposed

9   capital structure contains less short-term debt than the Company normally employs, and Dr. Vander

10   Weide's estimated equity cost rate of 11.20% is unreasonably high primarily due to (1) an

11   excessive and upwardly-biased growth rate in his DCF equity cost rate, and (2) outdated and

12   seriously flawed risk premium studies.

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

14   A.   Capital cost rates for U.S. corporations are currently at their lowest levels in more than

15   four decades. Corporate capital cost rates are determined by the level of interest rates and the risk

16   premium demanded by investors to buy the debt and equity capital of corporate issuers. The base

17   level of interest rates in the US economy is indicated by the rates on U.S. Treasury bonds. The

18   benchmark for long-term capital costs is the rate on ten-year Treasury bonds. The rates are

19   provided in the graph below from 1953 to the present. As indicated, prior to the secular decline

20   in rates that began last year, the 10-year Treasury had not been in the 4-5 percent range since the

-2-

1   1960s.

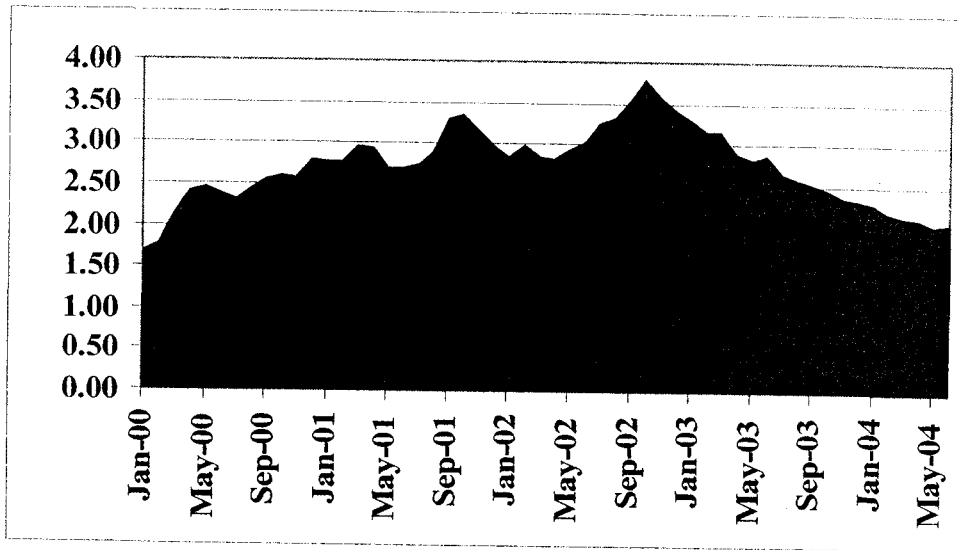**Yields on Ten-Year Treasury Bonds**
1953-Present
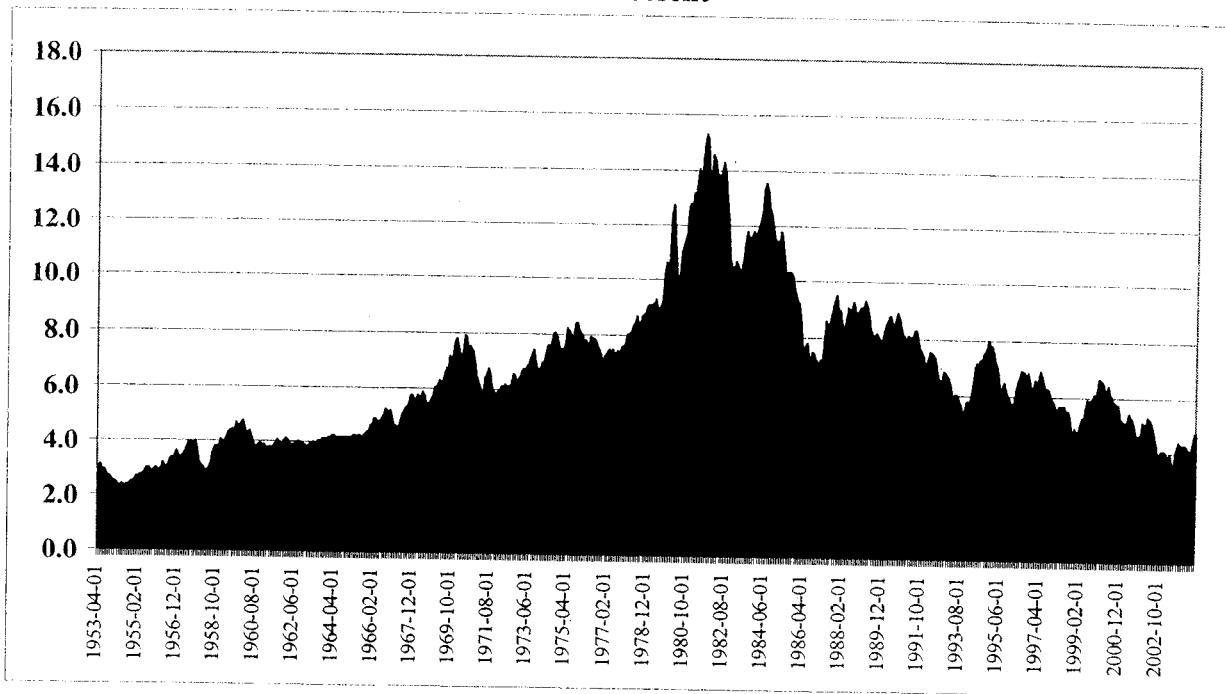
7   The second base component of the corporate capital cost rates is the risk premium. The

8   risk premium is the return premium required by investors to purchase riskier securities. Risk

9   premiums for bonds are the yield differentials between different bond classes as rated by

10   agencies such as Moody's, and Standard and Poor's. The graph below provides the yield

11   differential between Baa-rate corporate bonds and 10-year Treasuries. This yield differential

12   peaked at 350 basis points (BPs) in 2002 and has declined significantly since that time. This

13   is an indication that the market price of risk has declined and therefore the risk premium has

14   declined in recent years.

Corporate Bond Yield Spreads
Baa-Rated Corporate Bond Yield Minus Ten-Year Treasury Bond Yield

Source: http://www.treas.gov/offices/domestic-finance/debt-management/interest-rate/index.html

The equity risk premium is the return premium required to purchase stocks as opposed to bonds. Since the equity risk premium is not readily observable in the markets (as are bond risk premiums), and there are alternative approaches to estimating the equity premium, it is the subject of much debate. One way to estimate the equity risk premium is to compare the mean returns on bonds and stocks over long historic periods. Measured in this manner, the equity risk premium has been in the 5-7 percent range. But recent studies by leading academics indicate the forward-looking equity risk premium is in the 3-5 percent range. These authors indicate that historic equity risk premiums are upwardly biased measures of expected equity risk premiums. Jeremy Siegel, a Wharton finance professor and author of the popular book *Stocks for the Long Term*, published a study entitled "The

1   Shrinking Equity Risk Premium."[1] He concludes:

2   The degree of the equity risk premium calculated from data
3   estimated from 1926 is unlikely to persist in the future. The real
4   return on fixed-income assets is likely to be significantly higher than
5   estimated on earlier data. This is confirmed by the yields available
6   on Treasury index-linked securities, which currently exceed 4%.
7   Furthermore, despite the acceleration in earnings growth, the return
8   on equities is likely to fall from its historical level due to the very
9   high level of equity prices relative to fundamentals.
10

11   Even Alan Greenspan, the Chairman of the Federal Reserve Board, indicated in an October

12   14, 1999, speech on financial risk that the fact that equity risk premiums have declined

13   during the past decade is "not in dispute." His assessment focused on the relationship

14   between information availability and equity risk premiums.

15   There can be little doubt that the dramatic improvements in
16   information technology in recent years have altered our approach to
17   risk. Some analysts perceive that information technology has
18   permanently lowered equity premiums and, hence, permanently
19   raised the prices of the collateral that underlies all financial assets.
20

21   The reason, of course, is that information is critical to the
22   evaluation of risk. The less that is known about the current state of
23   a market or a venture, the less the ability to project future outcomes
24   and, hence, the more those potential outcomes will be discounted.
25

26   The rise in the availability of real-time information has reduced the
27   uncertainties and thereby lowered the variances that we employ to
28   guide portfolio decisions. At least part of the observed fall in
29   equity premiums in our economy and others over the past five
30   years does not appear to be the result of ephemeral changes in
31   perceptions. It is presumably the result of a permanent technology-
32   driven increase in information availability, which by definition

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

1   reduces uncertainty and therefore risk premiums. This decline is
2   most evident in equity risk premiums. It is less clear in the
3   corporate bond market, where relative supplies of corporate and
4   Treasury bonds and other factors we cannot easily identify have
5   outweighed the effects of more readily available information about
6   borrowers.[2]
7

8   In sum, the relatively low interest rates in today's markets as well as the lower risk

9 premiums required by investors indicate that capital costs for U.S. companies are the lowest in

10 decades. In addition, last year's new tax law further lowered capital cost rates for companies.

11 **Q.**   **HOW DID LAST YEAR'S NEW TAX LAW REDUCE THE COST OF CAPITAL**

12 **FOR COMPANIES?**

13 A.   On May 28th of last year, President Bush signed the *Jobs and Growth Tax Relief*

14 *Reconciliation Act of 2003*. The primary purpose of this legislation was to reduce taxes to

15 enhance economic growth. A primary component of the new tax law was a significant reduction

16 in the taxation of corporate dividends for individuals. Dividends have been described as "double-

17 taxed." First, corporations pay taxes on the income they earn before they pay dividends to

18 investors, then investors pay taxes on the dividends that they receive from corporations. One of

19 the implications of the double taxation of dividends is that, all else equal, it results in a higher

20 cost of raising capital for corporations. The new tax legislation reduces the effect of double

21 taxation of dividends by lowering the tax rate on dividends from the 30 percent range (the

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

1   average tax bracket for individuals) to 15 percent.

2   Overall, the new tax law reduced the pre-tax return requirements of investors, thereby

3   reducing corporations' cost of equity capital. This is because the reduction in the taxation of

4   dividends for individuals enhances their after-tax returns and thereby reduces their pre-tax

5   required returns. This reduction in pre-tax required returns (due to the lower tax on dividends)

6   effectively reduces the cost of equity capital for companies. The new tax law also reduced the tax

7   rate on long-term capital gains from 20% to 15%. The magnitude of the reduction in corporate

8   equity cost rates is debatable, but my assessment indicates that it could be as large as 100 basis

9   points. (See Exhibit_(JRW-2).

10

11   **II. COMPARISON GROUP SELECTION**

12

13 **Q.   PLEASE DESCRIBE YOUR APPROACH TO DEVELOPING A FAIR RATE OF**

14 **RETURN RECOMMENDATION FOR KAWC.**

15 A.   To develop a fair rate of return recommendation for KAWC, I evaluated the return

16 requirements of investors on the common stock of two groups of publicly-held water service

17 companies.

18 **Q.   PLEASE DESCRIBE YOUR GROUPS OF WATER SERVICE COMPANIES.**

19 A.   The two groups of water service companies were selected based on the following criteria:

20 (1) listed as water utility companies and covered by *C.A. Turner Utility Reports*, and (2) water

1 revenues of at least 80% of total revenues. The nine water companies that met these criteria were

2 then classified as the Small Water Company Group (annual water revenues of less than $100M) and

3 the Large Water Company Group (annual water revenues of more than $100M). The Small Water

4 Company Group (SWC Group) includes Artesian Resources, Connecticut Water Service Co.,

5 Middlesex Water Company, Pennichuck Corporation, and the York Water Company. The Large

6 Water Company Group (LWC Group) includes American States Water Company, Aqua America,

7 Inc., California Water Service Co., and SJW Corporation.

8   Summary financial statistics for the two groups are provided on page 1 of Exhibit_(JRW-3).

9 On average, the SWC Group has average net plant of $147.9 million and average total revenues of

10 $39.1 million. The group has an average common equity ratio of 46.4%, and a current average

11 earned return on common equity of 8.7%. The primary service territories for the water companies

12 in this group are New Hampshire, Delaware, New Jersey, Connecticut, and Pennsylvania. The

13 mean net plant and total revenues for the LWC Group are $780.4 million and $259.5 million,

14 respectively. This group's average common equity ratio and earned return on common equity are

15 46.8% and 9.1%, respectively. The primary service territory for three of the four companies in the

16 LWC Group is California.

17   KAWC, with operating revenues and net plant of $43.5M and $206.5M, respectively, is

18 more similar to the SWC Group and therefore the results for this group are the most appropriate in

19 gauging a required rate of return for KAWC. The LWC Group, which is much larger than KAWC

20 and is concentrated in California, is used to provide another yardstick for the results of the SWC

1 Group.

2

III. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES

4

5 **Q.** **WHAT ARE THE COMPANY'S PROPOSED CAPITAL STRUCTURE RATIOS**

6 **AND SENIOR CAPITAL COST RATES?**

7 A.   KAWC has proposed the following capital structure ratios in Exhibit_(MAM-2): 3.719%

8 short-term debt, 51.376% long-term debt, 3.78% preferred stock, and 41.125% common equity.

9 These figures reflect the thirteen-month pro forma amounts of the alternative sources of capital.

10 The company has also proposed a short-term debt cost rate of 2.70%, a long-term debt cost rate of

11 6.33%, and a preferred stock rate of 7.22%.

12 **Q.** **WHAT CAPITAL STRUCTURE RATIOS AND SENIOR CAPITAL COST RATES**

13 **ARE YOU USING TO ESTIMATE AN OVERALL RATE OF RETURN FOR KAWC?**

14 A.   On page 1 of Exhibit_(JRW-4), I show the quarterly capitalization ratios of KAWC over the

15 three years ending December, 2003. These figures were provided by Company Witness Mr. Miller

16 in response to Attorney General Data Request No. 152. The quarterly figures highlight the fact that

17 KAWC (1) consistently uses short-term debt as a source of capital, (2) refinances short-term debt

18 with long-term debt at different intervals over time, as it did in the Spring of 2004; and (3) uses

19 short-term debt as a source of capital in larger amounts than the Company is proposing in this case.

20 In light of the Company's historic use of short-term debt, I will use the average of the quarterly

1 capitalization ratios over the past three years as my proposed capital structure. These figures

2 represent how KAWC has actually financed itself over time. I will adopt KAWC's senior capital

3 cost rates. Hence, my proposed capital structure and senior capital cost rates are.

4
5

Kentucky-American Water Company
Proposed Capital Structure and Senior Capital Cost Rates

Source of Capital	Capitalization Ratio	Cost Rate
Short-Term Debt	7.78%	2.70%
Long-Term Debt	46.41%	6.33%
Preferred Stock	4.60%	7.22%
Common Equity	41.21%	

6
7
8 This capital structure contains more short-term debt and less long-term debt that that proposed by

9 KAWC and also has slightly higher preferred stock common equity ratios.

10

11 ## IV. THE COST OF COMMON EQUITY CAPITAL

12 ### A. OVERVIEW

13

14 **Q. WHY MUST AN OVERALL COST OF CAPITAL OR FAIR RATE OF RETURN**

15 **BE ESTABLISHED FOR A PUBLIC UTILITY?**

16 A.   In a competitive industry, the return on a firm's common equity capital is determined

17 through the competitive market for its goods and services. Due to the capital requirements needed

18 to provide utility services, however, and to the economic benefit to society from avoiding

19 duplication of these services, some public utilities are monopolies. It is not appropriate to permit

20 monopoly utilities to set their own prices because of the lack of competition and the essential nature

1 of the services. Thus, regulation seeks to establish prices which are fair to consumers and at the

2 same time are sufficient to meet the operating and capital costs of the utility, i.e., provide an

3 adequate return on capital to attract investors.

4 **Q. PLEASE PROVIDE AN OVERVIEW OF THE COST OF CAPITAL IN THE**

5 **CONTEXT OF THE THEORY OF THE FIRM.**

6 A.   The total cost of operating a business includes the cost of capital. The cost of common

7 equity capital is the expected return on a firm's common stock that the marginal investor would

8 deem sufficient to compensate for risk and the time value of money. In equilibrium, the expected

9 and required rates of return on a company's common stock are equal.

10   Normative economic models of the firm, developed under very restrictive assumptions,

11 provide insight into the relationship between firm performance or profitability, capital costs, and the

12 value of the firm. Under the economist's ideal model of perfect competition, where entry and exit is

13 costless, products are undifferentiated, and there are increasing marginal costs of production, firms

14 produce up to the point where price equals marginal cost. Over time, a long-run equilibrium is

15 established where price equals average cost, including the firm's capital costs. In equilibrium, total

16 revenues equal total costs, and because capital costs represent investors' required return on the

17 firm's capital, actual returns equal required returns and the market value and the book value of the

18 firm's securities must be equal.

19   In the real world, firms can achieve competitive advantage due to product market

20 imperfections - most notably through product differentiation (adding real or perceived value to

1 products) and achieving economies of scale (decreasing marginal costs of production). Competitive

2 advantage allows firms to price products above average cost and thereby earn accounting profits

3 greater than those required to cover capital costs. When these profits are in excess of that required

4 by investors, or when a firm earns a return on equity in excess of its cost of equity, investors

5 respond by valuing the firm's equity in excess of its book value.

6   James M. McTaggart, founder of the international management consulting firm Marakon

7 Associates, has described this essential relationship between the return on equity, the cost of equity,

8 and the market-to-book ratio in the following manner:[3]

9   Fundamentally, the value of a company is determined by the cash flow it
10 generates over time for its owners, and the minimum acceptable rate of return
11 required by capital investors. This "cost of equity capital" is used to discount the
12 expected equity cash flow, converting it to a present value. The cash flow is, in turn,
13 produced by the interaction of a company's return on equity and the annual rate of
14 equity growth. High return on equity (ROE) companies in low-growth markets, such
15 as Kellogg, are prodigious generators of cash flow, while low ROE companies in
16 high-growth markets, such as Texas Instruments, barely generate enough cash flow
17 to finance growth.
18
19   A company's ROE over time, relative to its cost of equity, also determines
20 whether it is worth more or less than its book value. If its ROE is consistently
21 greater than the cost of equity capital (the investor's minimum acceptable return), the
22 business is economically profitable and its market value will exceed book value. If,
23 however, the business earns an ROE consistently less than its cost of equity, it is
24 economically unprofitable and its market value will be less than book value.
25

26 As such, the relationship between a firm's return on equity, cost of equity, and market-to-book ratio

27 is relatively straightforward. A firm which earns a return on equity above its cost of equity will see

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

1   its common stock sell at a price above its book value. Conversely, a firm which earns a return on

2   equity below its cost of equity will see its common stock sell at a price below its book value.

3   **Q. WHAT ECONOMIC FACTORS HAVE AFFECTED THE COST OF EQUITY**

4   **CAPITAL FOR PUBLIC UTILITIES?**

5   A.   Exhibit_(JRW-5) provides indicators of public utility equity cost rates over the past decade.

6   Page 1 shows the yields on 'A' rated public utility bonds. These yields peaked in the early 1990s

7   at 10%, and have generally declined since that time. In particular, over the past two years they have

8   declined from the seven percent range to the five percent range. As of June 2004, the yield was

9   5.3%. Page 2 provides the dividend yields for the fifteen utilities in the Dow Jones Utilities

10   Average over the past decade. These yields peaked in 1994 at 6.7%. Since that time they have

11   declined and have remained in the 4.5-5.0 percent range in recent years.

12   Average earned returns on common equity and market-to-book ratios are given on page 3 of

13   Exhibit_(JRW-5). Over the past decade, earned returns on common equity have consistently been

14   in the 10.0 - 13.0 percent range. The low point was 10.3 % in 1997 and they have increased to 12.5

15   percent range as of the year 2003. Over the past decade, market-to-book ratios for this group

16   bottomed out at 128% in 1994 and they have increased to the 150-180 percent range in recent years.

17   The indicators in Exhibit_(JRW-5), coupled with the overall decrease in interest rates,

18   suggest that capital costs for the Dow Jones Utilities have decreased over the past decade.

19   Specifically for the equity cost rate, the significant increase in the market-to-book ratios, coupled

20   with only a much smaller increase in the average return on equity, suggests a substantial decline in

1 the overall equity cost rate.

2 **Q. WHAT FACTORS DETERMINE INVESTORS' EXPECTED OR REQUIRED**

3 **RATE OF RETURN ON EQUITY?**

4 A. The expected or required rate of return on common stock is a function of market-wide, as

5 well as company-specific, factors. The most important market factor is the time value of money as

6 indicated by the level of interest rates in the economy. Common stock investor requirements

7 generally increase and decrease with like changes in interest rates. The perceived risk of a firm is

8 the predominant factor that influences investor return requirements on a company-specific basis. A

9 firm's investment risk is often separated into business and financial risk. Business risk

10 encompasses all factors that affect a firm's operating revenues and expenses. Financial risk results

11 from incurring fixed obligations in the form of debt in financing its assets.

12 **Q. HOW DOES THE INVESTMENT RISK OF WATER UTILITIES COMPARE**

13 **WITH THAT OF OTHER INDUSTRIES?**

14 A. Due to the essential nature of their service as well as their regulated status, public utilities

15 are exposed to a lesser degree of business risk than other, non-regulated businesses. The relatively

16 low level of business risk allows public utilities to meet much of their capital requirements through

17 borrowing in the financial markets, thereby incurring greater than average financial risk.

18 Nonetheless, the overall investment risk of public utilities is below most other industries.

19 Exhibit_(JRW-6) provides an assessment of investment risk for 100 industries as measured by

20 beta, which according to modern capital market theory is the only relevant measure of investment

1   risk that need be of concern for investors. These betas come from the *Value Line Investment Survey*

2   and are compiled by Aswath Damodoran of New York University. They may be found on the

3   Internet at http://www.stern.nyu.edu/~adamodar/. The study shows that the investment risk of

4   public utilities is quite low. In fact, the beta for the water utility industry is next to the lowest of the

5   100 industries. Only the precious metals industry is lower. As such, the cost of equity for the water

6   utility industry is among the lowest of all industries in the U.S.

7   **Q.**   **HOW CAN THE EXPECTED OR REQUIRED RATE OF RETURN ON COMMON**

8   **EQUITY CAPITAL BE DETERMINED?**

9   **A.**   The costs of debt and preferred stock are normally based on historic or book values and can

10   be determined with a great degree of accuracy. The cost of common equity capital, however,

11   cannot be determined precisely and must instead be estimated from market data and informed

12   judgment. This return to the stockholder should be commensurate with returns on investments in

13   other enterprises having comparable risks.

14   According to valuation principles, the present value of an asset equals the discounted value

15   of its expected future cash flows. Investors discount these expected cash flows at their required rate

16   of return that, as noted above, reflects the time value of money and the perceived riskiness of the

17   expected future cash flows. As such, the cost of common equity is the rate at which investors

18   discount expected cash flows associated with common stock ownership.

19   Models have been developed to ascertain the cost of common equity capital for a firm.

20   Each model, however, has been developed using restrictive economic assumptions. Consequently,

1   judgment is required in selecting appropriate financial valuation models to estimate a firm's cost of

2   common equity capital, in determining the data inputs for these models, and in interpreting the

3   models' results. All of these decisions must take into consideration the firm involved as well as

4   conditions in the economy and the financial markets.

5   **Q.   HOW DO YOU PLAN TO ESTIMATE THE COST OF EQUITY CAPITAL FOR**

6   **THE COMPANY?**

7   A.   I rely primarily on the discounted cash flow model to estimate the cost of equity capital. I

8   believe that the DCF model provides the best measure of equity cost rates for public utilities. I

9   have also performed a Capital Asset Pricing Model (CAPM) study, but I give these results less

10 weight because I believe that risk premium studies, of which the CAPM is one form, provide a less

11 reliable indication of equity cost rates for public utilities.

12

13   **B. DISCOUNTED CASH FLOW ANALYSIS**

14

15 **Q.   BRIEFLY DESCRIBE THE THEORY BEHIND THE TRADITIONAL DCF**

16 **MODEL.**

17 A.   According to the discounted cash flow model, the current stock price is equal to the

18 discounted value of all future dividends that investors expect to receive from investment in the firm.

19 As such, stockholders' returns ultimately result from current as well as future dividends. As

20 owners of a corporation, common stockholders are entitled to a pro-rata share of the firm's earnings.

1   The DCF model presumes that earnings that are not paid out in the form of dividends are

2   reinvested in the firm so as to provide for future growth in earnings and dividends. The rate at

3   which investors discount future dividends, which reflects the timing and riskiness of the expected

4   cash flows, is interpreted as the market's expected or required return on the common stock.

5   Therefore this discount rate represents the cost of common equity. Algebraically, the DCF model

6   can be expressed as:

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

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

13   **Q.   IS THE DCF MODEL CONSISTENT WITH VALUATION TECHNIQUES**

14   **EMPLOYED BY INVESTMENT FIRMS?**

15   A.   Yes. Virtually all investment firms use some form of the DCF model as a valuation

16   technique. One common application for investment firms is called the three-stage DCF or dividend

17   discount model (DDM). The stages in a three-stage DCF model are discussed below. This model

18   presumes that a company's dividend payout progresses initially through a growth stage, then

19   proceeds through a transition stage, and finally assumes a steady state stage. The dividend payment

20   stage of a firm depends on the profitability of its internal investments, which, in turn, is largely a

21   function of the life cycle of the product or service. These stages are depicted in the graphic below

1   labeled the Three Stage DCF Model. [4]

2   1.   **Growth stage**: Characterized by rapidly expanding sales, high profit margins, and
3   abnormally high growth in earnings per share. Because of highly profitable
4   expected investment opportunities, the payout ratio is low. Competitors are
5   attracted by the unusually high earnings, leading to a decline in the growth rate.
6
7   2.   **Transition stage**: In later years, increased competition reduces profit margins and
8   earnings growth slows. With fewer new investment opportunities, the company
9   begins to pay out a larger percentage of earnings.
10
11   3.   **Maturity (steady-state) stage**: Eventually the company reaches a position where
12   its new investment opportunities offer, on average, only slightly attractive returns
13   on equity. At that time its earnings growth rate, payout ratio, and return on equity
14   stabilize for the remainder of its life. The constant-growth DCF model is appropriate
15   when a firm is in the maturity stage of the life cycle.
16
17   In using this model to estimate a firm's cost of equity capital, dividends are projected into

18   the future using the different growth rates in the alternative stages, and then the equity cost rate is

19   the discount rate that equates the present value of the future dividends to the current stock price.

20

Three-Stage DCF Model
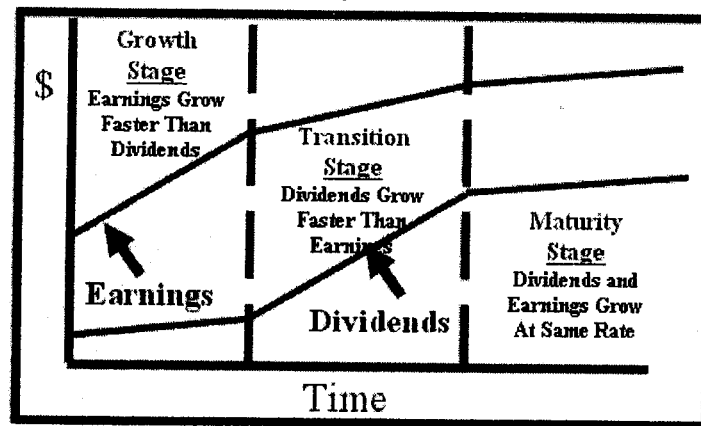
21

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

1 **Q.   HOW DO YOU ESTIMATE STOCKHOLDERS' EXPECTED OR REQUIRED**

2 **RATE OF RETURN USING THE DCF MODEL?**

3 A.   Under certain assumptions, including a constant and infinite expected growth rate, and

4 constant dividend/earnings and price/earnings ratios, the DCF model can be simplified to the

5 following:

6
7 $$P = \frac{D_1}{k - g}$$
8
9

10 where D_1 represents the expected dividend over the coming year and g is the expected growth rate

11 of dividends.   This is known as the constant-growth version of the DCF model.   To use the

12 constant-growth DCF model to estimate a firm's cost of equity, one solves for k in the above

13 expression to obtain the following:

14
15
16 $$k = \frac{D_1}{P} + g$$
17
18

19   Given the regulated status of public utilities, and especially the fact that their returns on

20 investment are effectively set through the ratemaking process, the industry would be in the steady-

21 state stage of a three-stage DCF. The DCF valuation procedure for companies in this stage is the

22 constant-growth DCF. In the constant-growth version of the DCF model, the current dividend

23 payment and stock price are directly observable. Therefore, the primary problem and controversy

1   in applying the DCF model to estimate equity cost rates entails estimating investors' expected

2   dividend growth rate

3   Q.   WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF

4   METHODOLOGY?

5   A.   One should be sensitive to several factors when using the DCF model to estimate a firm's

6   cost of equity capital. In general, one must recognize the assumptions under which the DCF model

7   was developed in estimating its components (the dividend yield and expected growth rate). The

8   dividend yield can be measured precisely at any point in time, but tends to vary somewhat over

9   time. Estimation of expected growth is considerably more difficult. One must consider recent firm

10 performance, in conjunction with current economic developments and other information available

11 to investors, to accurately estimate investors' expectations.

12 Q.   PLEASE DISCUSS EXHIBIT_(JRW-7).

13 A.   My DCF analysis is provided in Exhibit_(JRW-7). The DCF summary is on page 1 of

14 this Exhibit and the supporting data and analysis for the dividend yield and expected growth rate

15 are provided on the following pages.

16 Q.   WHAT DIVIDEND YIELDS DO YOU EMPLOY IN YOUR DCF ANALYSIS FOR

17 THE WATER GROUPS?

18 A.   The dividend yields on the common stock for the SWC and LWC Groups are provided on

19 page 2 of Exhibit_(JRW-7) for the twelve-month period ending August, 2004. Over this period,

20 the average monthly dividend yields for the SWC and LWC Groups are 3.10% and 3.30%,

1   respectively. As of August, 2004, the mean dividend yield for both groups is 3.50%. For the

2   DCF dividend yields for the two groups, I will use the average of the twelve month and August,

3   2004 dividend yields. Hence, the DCF dividends yields for the SWC and LWC Groups are

4   3.30% and 3.40%, respectively.

5   **Q.   PLEASE DISCUSS THE APPROPRIATE ADJUSTMENT TO THE SPOT**

6   **DIVIDEND YIELD.**

7   A.   According to the traditional DCF model, the dividend yield term relates to the dividend

8   yield over the coming period. As indicated by Professor Myron Gordon, who is commonly

9   associated with the development of the DCF model for popular use, this is obtained by (1)

10   multiplying the expected dividend over the coming quarter by 4, and (2) dividing this dividend by

11   the current stock price to determine the appropriate dividend yield for a firm, which pays dividends

12   on a quarterly basis.[5]

13   In applying the DCF model, some analysts adjust the current dividend for growth over the

14   coming year as opposed to the coming quarter. This can be complicated because firms tend to

15   announce changes in dividends at different times during the year. As such, the dividend yield

16   computed based on presumed growth over the coming quarter as opposed to the coming year can be

17   quite different. Consequently, it is common for analysts to adjust the dividend yield by some

18   fraction of the long-term expected growth rate.

19   The appropriate adjustment to the dividend yield is further complicated in the regulatory

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[5] *Petition for Modification of Prescribed Rate of Return*, Federal Communications Commission, Docket No. 79-05,

1   process when the overall cost of capital is applied to a projected or end-of-future-test-year rate base.

2   The net effect of this application is an overstatement of the equity cost rate estimate derived from

3   the DCF model. In the context of the constant-growth DCF model, both the adjusted dividend

4   yield and the growth component are overstated. Put simply, the overstatement results from

5   applying an equity cost rate computed using current market data to a future or test-year-end rate

6   base which includes growth associated with the retention of earnings during the year.

7   **Q.   GIVEN THIS DISCUSSION, WHAT ADJUSTMENT FACTOR WILL YOU USE**

8   **FOR YOUR DIVIDEND YIELD?**

9   A.   I will adjust the dividend yield for the two groups by 1/2 the expected growth so as to

10 reflect growth over the coming year.

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

12 A.   There is much debate as to the proper methodology to employ in estimating the growth

13 component of the DCF model. By definition, this component is investors' expectation of the long-

14 term dividend growth rate. Presumably, investors use some combination of historic and/or

15 projected growth rates for earnings and dividends per share and for internal or book value growth to

16 assess long-term potential.

17 **Q.   WHAT GROWTH DATA HAVE YOU REVIEWED FOR YOUR TWO GROUPS**

18 **OF WATER COMPANIES?**

19 A.   I have analyzed a number of measures of growth for the water companies. I calculated

---

Direct Testimony of Myron J. Gordon and Lawrence I. Gould at 62 (April 1980).

1   historic growth rates in sales, earnings, dividends, and book value per share growth rates for the

2   companies in the two groups. For the water companies covered by the *Value Line Investment*

3   *Survey,* I reviewed *Value Line's* historic and projected growth rate estimates for earnings per share

4   (EPS), dividends per share (DPS), and book value per share (BVPS). In addition, I have utilized

5   earnings growth rate forecasts as provided by Zacks, Reuters, and First Call. These services solicit

6   5-year earning growth rate projections for securities analysts and compile and publish the averages

7   of these forecasts on a monthly basis. They are readily available on the Internet. Finally, I have

8   also assessed prospective growth as measured by prospective earnings retention rates and earned

9   returns on common equity.

10 **Q.   PLEASE DISCUSS HISTORIC GROWTH IN EARNINGS AND DIVIDENDS AS**

11 **WELL AS INTERNAL GROWTH.**

12 A.   Historic growth rates for EPS, DPS, and BVPS are readily available to virtually all

13 investors and presumably an important ingredient in forming expectations concerning future

14 growth. However, one must use historic growth numbers as measures of investors' expectations

15 with caution. In some cases, past growth may not reflect future growth potential. Also, employing

16 a single growth rate number (for example, for five or ten years), is unlikely to accurately measure

17 investors' expectations due to the sensitivity of a single growth rate figure to fluctuations in

18 individual firm performance as well as overall economic fluctuations (i.e., business cycles).

19 However, one must appraise the context in which the growth rate is being employed. According to

20 the conventional DCF model, the expected return on a security is equal to the sum of the dividend

1 yield and the expected long-term growth in dividends. Therefore, to best estimate the cost of

2 common equity capital using the conventional DCF model, one must look to long-term growth rate

3 expectations.

4 Internally generated growth is a function of the percentage of earnings retained within the

5 firm (the earnings retention rate) and the rate of return earned on those earnings (the return on

6 equity). The internal growth rate is computed as the retention rate times the return on equity.

7 Internal growth is significant in determining long-run earnings and, therefore, dividends. Investors

8 recognize the importance of internally generated growth and pay premiums for stocks of companies

9 that retain earnings and earn high returns on internal investments.

10 **Q. PLEASE DISCUSS THE HISTORIC GROWTH OF THE COMPANIES IN THE**

11 **TWO GROUPS.**

12 A. Page 3 of Exhibit_(JRW-7) provides the 3-, 5-, and 10- year compounded annual growth

13 rates for the companies in the two groups. For the SWC Group, EPS growth is the lowest and also

14 the most volatile. The other growth rates are more consistent over time, with sales growth in the

15 5.0% range, and DPS and BVPS growth in 4.0% range. Overall, annual historic growth appears to

16 be about 3.5%. Historic growth for the LWC Group is slightly higher – in the 4.75% range – with

17 otherwise similar growth rate characteristics as the SWC Group. EPS growth is the lowest and

18 most volatile, and the other growth rates are more consistent, with the sales growth rate being the

19 highest.

20 **Q. PLEASE SUMMARIZE YOUR ANALYSIS OF *VALUE LINE'S* HISTORIC AND**

1 **PROJECTED GROWTH RATES FOR THE GROUPS OF WATER COMPANIES.**

2 A.   Page 4 of Exhibit_(JRW-7) provides a summary of historic growth rates for the companies

3 in the group as provided in the *Value Line Investment Survey*. The coverage of the SWC Group is

4 very limited and provides little insight into expected growth. Historic growth in earnings,

5 dividends, and book value for the LWC Group ranges from 1.0% to 5.0%, with an average of 3.4%.

6 Projections of growth are available for three of the four companies in the LWC Group in *Value*

7 *Line.* For these three companies, the average of projected growth for earnings, dividends, and book

8 value is 7.2%. For the LWC Group, prospective internal growth of 5.1% is indicated, with *Value*

9 *Line*'s average projected retention and equity return rates of 46.5% and 11.0%.

10 **Q.   PLEASE ASSESS GROWTH FOR THE GROUP AS MEASURED BY ANALYSTS'**

11 **FORECASTS OF EXPECTED 5-YEAR GROWTH IN EPS.**

12 A.   Zacks, First Call, and Reuters collect, summarize, and publish Wall Street analysts'

13 projected 5-year EPS growth rate forecasts for companies. These forecasts are provided for the

14 SWC and LWC Group companies on page 5 of Exhibit_(JRW-7). For the SWC Group, analysts'

15 growth forecasts are only available for three companies – Artesian Resources, Middlesex Water Co.

16 and York Water Co. The average of these forecasts is 7.1%. Analysts' growth forecasts are

17 available for three of the four companies in the LWC Group, and the average is 5.9%.[6]

18 **Q.   PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORIC AND**

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[6]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 5-year EPS growth rates from the three services for each company to arrive at an expected EPS growth rate by company.

1 **PROSPECTIVE GROWTH OF THE TWO WATER COMPANY GROUPS.**

2 A.   For the SWC Group, historic indicators imply an average growth rate of 3.5%. Projected

3 growth rates for three companies in the group average 7.1%. Since projections for the group are

4 very limited, investors are likely to look to historic growth rates as well as the projected growth of

5 other companies in the industry.   The average projected EPS growth rate for the LWC Group is

6 5.9%.

7   Given a historic and projected growth rate range of 3.5% to 7.1% for the SWC Group, and

8 giving slighter greater weight to the projected growth rate figures, an expected growth rate of 5.5%

9 is reasonable for these smaller water companies. For the LWC Group, historic growth rate measures

10 are in the 4.75% range. Prospective internal growth is 5.1%, and the average projected EPS growth

11 rate for the LWC Group is 5.9%. As such, expected growth would appear to be in the 5.0-5.5%

12 range. Given this range, an expected growth rate of 5.25% is reasonable for the LWC Group.

13 **Q.   BASED ON THE ABOVE, ANALYSIS, WHAT IS YOUR INDICATED COMMON**

14 **EQUITY COST RATE FROM THE DCF MODEL FOR TWO GROUPS?**

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

16
17
18   DCF Equity Cost Rate (k) $= \dfrac{D_1}{P} + g$
19
20

21   SWC Group   3.30% * 1.02750 + 5.50% = 8.89%

22   LWC Group   3.40% * 1.02635 + 5.25% = 8.74%

C. CAPITAL ASSET PRICING MODEL RESULTS

1

2

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

4 A.   The CAPM is a more general risk premium approach to gauging a firm's cost of equity

5 capital. According to the risk premium approach, the cost of equity is the sum of the interest rate on

6 a risk-free bond (R_f) and a risk premium (RP), as in the following:

7

8                          $k = R_f + RP$

9 The yield on long-term Treasury securities is normally used as R_f. Risk premiums are measured in

10 different ways. The CAPM is a theory of the risk and expected returns of common stocks. In the

11 CAPM, two types of risk are associated with a stock: firm-specific risk or unsystematic risk; and

12 market or systematic risk, which is measured by a firm's beta. The only risk that investors

13 receive a return for bearing is systematic risk.

14   According to the CAPM, the expected return on a company's stock, which is also the

15 equity cost rate (K), is equal to:

16      $K = (R_f) + ß_{ibm} * [E(R_m) - (R_f)]$

17 Where:
18
19 • K represents the estimated rate of return on the stock;
20 • $E(R_m)$ represents the expected return on the overall stock market. Frequently, the 'market'
21   refers to the S&P 500;
22 • (R_f) represents the risk-free rate of interest;

1   •   *[E(R$_m$) - (R$_f$)]* represents the expected equity or market risk premium—the excess return
2   that an investor expects to receive above the risk-free rate for investing in risky stocks;
3   and
4   •   *Beta*—(ß$_i$) is a measure of the systematic risk of an asset.
5   To estimate the required return or cost of equity using the CAPM requires three inputs:

6 the risk-free rate of interest (R$_f$), the beta (ß$_i$), and the expected equity or market risk premium,

7 *[E(R$_m$) - (R$_f$)]*. R$_f$ is the easiest of the inputs to measure – it is the yield on long-term Treasury

8 bonds. ß$_i$, the measure of systematic risk, is a little more difficult to measure because there are

9 different opinions about what adjustments, if any, should be made to historic betas due to their

10 tendency to regress to 1.0 over time. And finally, an even more difficult input to measure is the

11 expected equity or market risk premium, *[E(R$_m$) - (R$_f$)]*. I will discuss each of these inputs, with

12 most of the discussion focusing on the expected equity risk premium.

13 **Q.**   **PLEASE DISCUSS EXHIBIT_(JRW-8).**

14 A.   Exhibit_(JRW-8) provides the summary results for my CAPM study. Page 1 gives the

15 results, and the following pages contain the supporting data.

16 **Q.**   **PLEASE DISCUSS THE RISK-FREE INTEREST RATE IN YOUR CAPM?**

17 A.   The yield on long-term Treasury bonds has usually been viewed as the risk-free rate of

18 interest in the CAPM. The yield on long-term Treasury bonds, in turn, was normally considered to

19 be the yield on Treasuries with 30-year maturities. However, in recent years, the yield on 10-year

20 Treasury bonds has replaced the yield on 30-year Treasury bonds as the benchmark long-term

21 Treasury rate. The 10-year Treasury yields over the past five years are shown in the chart below.

22 These rates hit a 60-year low last summer at 3.33%. They increased with the rebounding

1 economy to 4.75% in June of this year, but have since declined to the 4.25% range due primarily

2 to concerns over the negative impact of higher energy prices on the economy. Given this recent

3 range, I will use 4.50% as the risk-free rate, or R_f, in my CAPM.

Ten-Year U.S. Treasury Yields
January 2000-August 2004
Source: http://www.federalreserve.gov/releases/h15/current/h15.pdf
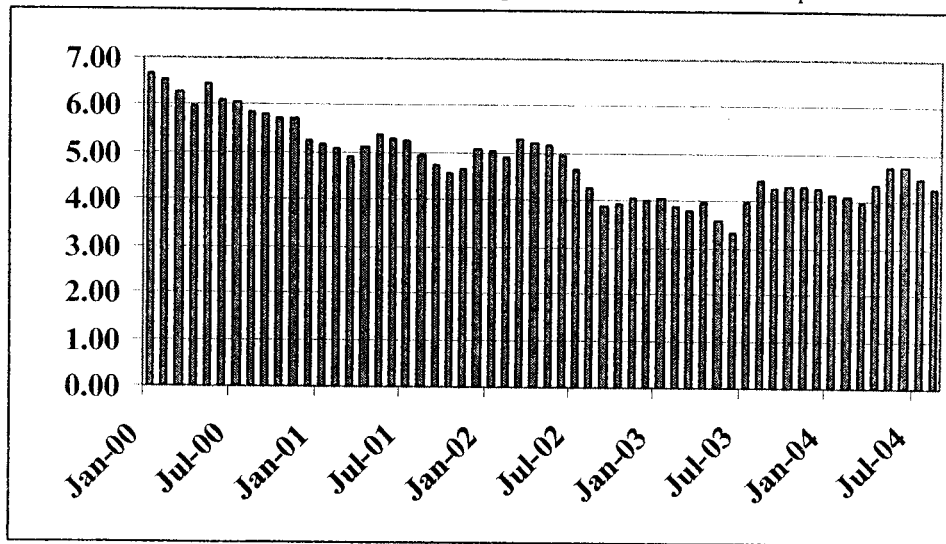
9 **Q.   WHAT BETAS ARE YOU EMPLOYING FOR YOUR TWO WATER GROUPS**

10 **IN YOUR CAPM?**

11 A.   Beta (ß) is a measure of the systematic risk of a stock. The market, usually taken to be

12 the S&P 500, has a beta of 1.0. The beta of a stock with the same price movement as the market

13 also has a beta of 1.0. A stock whose price movement is greater than that of the market, such as

14 a technology stock, is riskier than the market and has a beta greater than 1.0. A stock with below

15 average price movement, such as that of a regulated public utility, is less risky than the market

1   and has a beta less than 1.0. Estimating a stock's beta involves running a linear regression of a

2   stock's return on the market return as in the following:

Calculation of Beta
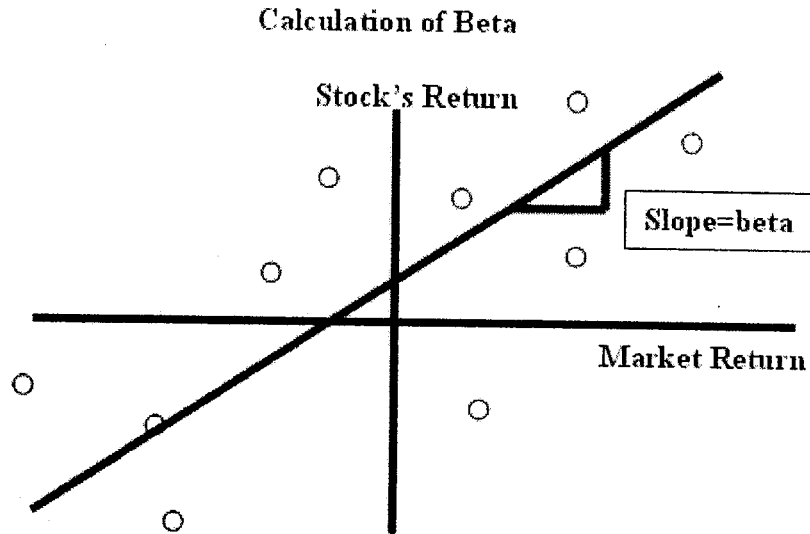
3

4   The slope of the regression line is the stock's ß. A steeper line indicates the stock is more

5   sensitive to the return on the overall market. This means that the stock has a higher ß and greater

6   than average market risk. A less steep line indicates a lower ß and less market risk.

7   Numerous online investment information services, such Yahoo and Reuters, provide

8   estimates of stock betas. Usually these services report different betas for the same stock. The

9   differences are usually due to (1) the time period over which the ß is measured and (2) any

10   adjustments that are made to reflect the fact that betas tend to regress to 1.0 over time. In

11   estimating an equity cost rate for KAWC using the two water groups, I am using the average

12   betas for the companies as provided by the *Value Line Investment Survey*. These betas are:

13

Betas for SWC Group Companies
Value Line Investment Survey

Connecticut Water Services Inc.	0.65
Middlesex Water	0.60
York Water Company	0.70
Average	**0.65**

Data Source: *Value Line Investment Survey*, July 30, 2004.

Betas for LWC Group Companies
Value Line Investment Survey

American States Water Co..	0.65
Aqua America, Inc.	0.75
California Water Service Group	0.70
SJW Corp.	0.55
Average	**0.66**

Data Source: *Value Line Investment Survey*, July 30, 2004.

Q. PLEASE DISCUSS THE DEBATE 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.

1 A.   The table below highlights the primary approaches to, and issues in, estimating the

2 expected equity risk premium.

3   **Risk Premium Approaches**

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

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

7   The traditional way to measure the equity risk premium was to use the difference between

8 historic average stock and bond returns. In this case, historic stock and bond returns, also called ex

9 post returns, were used as the measures of the market's expected return (known as the ex ante or

10 forward-looking expected return). This type of historic evaluation of stock and bond returns is

11 often called the "Ibbotson approach" after Professor Roger Ibbotson who popularized this method

12 of using historic financial market returns as measures of expected returns.   Most historic

13 assessments of the equity risk premium suggest an equity risk premium of 5-7 percent above the

14 rate on long-term Treasury bonds.   However, this can be a problem because (1) ex post returns are

-32-

1 not the same as ex ante expectations, (2) market risk premiums can change over time, increasing

2 when investors become more risk-averse, and decreasing when investors become less risk-averse,

3 and (3) market conditions can change such that ex post historic returns are poor estimates of ex

4 ante expectations.

5   The use of historic returns as market expectations has been criticized in numerous academic

6 studies.[7] The general theme of these studies is that the large equity risk premium discovered in

7 historic stock and bond returns cannot be justified by the fundamental data. These studies, which

8 fall under the category "Ex Ante Models and Market Data," compute ex ante expected returns using

9 market data to arrive at an expected equity risk premium. These studies have also been called

10 "Puzzle Research" after the famous study by Mehra and Prescott in which the authors first

11 questioned the magnitude of historic equity risk premiums relative to fundamentals.[8]

12 **Q.**   **PLEASE BRIEFLY SUMMARIZE SOME OF THE NEW ACADEMIC STUDIES**

13 **THAT DEVELOP EX ANTE EQUITY RISK PREMIUMS.**

14 **A.**   Two of the most prominent studies of ex ante expected equity risk premiums were by

15 Eugene Fama and Ken French (2002) and James Claus and Jacob Thomas (2001). The primary

16 debate in these studies revolves around two related issues: (1) the size of expected equity risk

17 premium, which is the return equity investors require above the yield on bonds; and (2) the fact that

18 estimates of the ex ante expected equity risk premium using fundamental firm data (earnings and

---

[7] The problems with using ex post historic returns as measure of ex ante expectation will be discussed at length later in my testimony.

1   dividends) are much lower than estimates using historic stock and bond return data. Fama and

2   French (2002), two of the most preeminent scholars in finance, use dividend and earnings growth

3   models to estimate expected stock returns and ex ante expected equity risk premiums.[9] They

4   compare these results to actual stock returns over the period 1951-2000. Fama and French estimate

5   that the expected equity risk premium from DCF models using dividend and earnings growth to be

6   between 2.55% and 4.32%. These figures are much lower than the ex post historic equity risk

7   premium produced from the average stock and bond return returns over the same period, which is

8   7.40%.

9   Fama and French conclude that the ex ante equity risk premium estimates using DCF

10   models and fundamental data are superior to those using ex post historic stock returns for three

11   reasons: (1) the estimates are more precise (a lower standard error); (2) the Sharpe ratio, which is

12   measured as the [(expected stock return – risk-free rate)/standard deviation], is constant over

13   time for the DCF models but more than doubles for the average stock-bond return model; and (3)

14   valuation theory specifies relationships between the market-to-book ratio, return on investment,

15   and cost of equity capital that favor estimates from fundamentals. They also conclude that the

16   high average stock returns over the past 50 years were the result of low expected returns and that

17   the average equity risk premium has been in the 3-4 percent range.

18   The study by Claus and Thomas of Columbia University provides direct support for the

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[8] Rahnish Mehra and Edward Prescott, "The Equity Premium: A Puzzle," *Journal of Monetary Economic* (1985).
[9] Eugene F. Fama and Kenneth R. French, "The Equity Premium," *The Journal of Finance*, April 2002. This paper may be downloaded from the Internet at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=236590.

1 findings of Fama and French.[10] These authors compute ex ante expected equity risk premiums over

2 the 1985-1998 period by (1) computing the discount rate that equates market values with the

3 present value of expected future cash flows, and (2) then subtracting the risk-free interest rate. The

4 expected cash flows are developed using analysts' earnings forecasts. The authors conclude that

5 over this period the ex ante expected equity risk premium is in the range of 3.0%. Claus and

6 Thomas note that, over this period, ex post historic stock returns overstate the ex ante expected

7 equity risk premium because as the expected equity risk premium has declined, stock prices have

8 risen. In other words, from a valuation perspective, the present value of expected future returns

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

10 returns that have exceeded investors' expectations and therefore ex post historic equity risk

11 premium estimates are biased upwards as measures of ex ante expected equity risk premiums.

12 **Q. PLEASE PROVIDE A SUMMARY OF THE EX ANTE EQUITY RISK**

13 **PREMIUM STUDIES.**

14 A.   Richard Derrig and Elisha Orr (2003) recently completed the most comprehensive paper to

15 date which summarizes and assesses the many risk premium studies.[11] Appendix B of their study,

16 which provides summary statistics for the different studies, is included as pages 2 and 3 of

17 Exhibit_(JRW-8). The risk premium studies listed under the 'Social Security' and 'Puzzle

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[10] James Claus and Jacob Thomas, "Equity Risk Premia as Low as Three Percent? Empirical Evidence from Analysts' Earnings Forecasts for Domestic and International Stock Market," *Journal of Finance*. (October 2001).
[11] 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.

1   Research' sections are primarily ex ante expected equity risk premium studies. Most of these

2   studies are performed by leading academic scholars in finance and economics. A review of the

3   'ERP Estimate' column in Appendix B of the Derrig and Orr study suggests that the average ex

4   ante equity risk premium estimate is in the 4.0% range.

5   **Q.   GIVEN THIS BACKGROUND INFORMATION, HOW WILL YOU ESTIMATE**

6   **AN EQUITY RISK PREMIUM FOR YOUR CAPM?**

7   A.   My equity risk premium is the average of: (1) the 4.0% average ex ante expected equity

8   risk premiums from the studies covered in the Derrig and Orr (2003) study, and (2) an ex ante

9   expected equity risk premium developed using Ibbotson and Chen's "building blocks

10   methodology."

11   **Q.   PLEASE DISCUSS THE EX ANTE EXPECTED EQUITY RISK PREMIUM**

12   **COMPUTED USING THE "BUILDING BLOCKS METHODOLOGY."**

13   A.   Ibbotson and Chen (2002) evaluate the ex post historic mean stock and bond returns in

14   what is called a "building blocks methodology."[12] They use 75 years of data and relate the

15   compounded historic returns to the different fundamental variables employed by different

16   researchers in building ex ante expected equity risk premiums. Among the variables included

17   were inflation, real EPS and DPS growth, ROE and book value growth, and P/E ratios. By

18   relating the fundamental factors to the ex post historic returns, the methodology bridges the gap

19   between the ex post and ex ante equity risk premiums. Ilmanen (2003) illustrates this approach

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[12] Roger Ibbotson and Peng Chen, "Long Run Returns: Participating in the Real Economy," *Financial Analysts*

1   using the geometric returns and five fundamental variables – inflation (CPI), dividend yield

2   (D/P), real earnings growth (RG), repricing gains (PEGAIN) and return interaction/reinvestment

3   (INT). [13] This is shown in the graph below. The first column breaks the 1926-2000 geometric

4   mean stock return of 10.7% into the different return components demanded by investors: the

5   historic Treasury bond return (5.2%), the excess equity return (5.2%), and a small interaction

6   term (0.3%). This 10.7% annual stock return over the 1926-2000 period can then be broken

7   down into the following fundamental elements: inflation (3.1%), dividend yield (4.3%), real

8   earnings growth (1.8%), repricing gains (1.3%) associated with higher P/E ratios, and a small

9   interaction term (0.2%).

10
11

Decomposing Equity Market Returns
The Building Blocks Methodology

	10.7%	10.7%	
	INT - .3%	INT - .2%	
		PEGAIN 1.3%	
	Excess Equity Return 5.2%	RG 1.8%	8.1%
			RG 3.0%
		D/P 4.3%	
			D/P 2.2%
	Bond Return 5.2%		
		CPI 3.1%	CPI 2.9%
	Ex Post Equity Return – 1926-2000	Equity Return Decomposed	Ex Ante Expected Equity Return
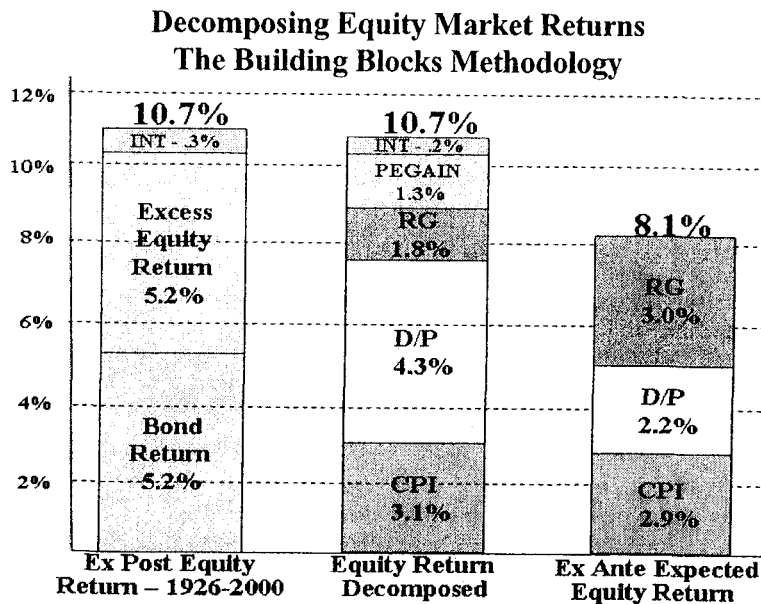
12

Journal, January 2003.

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

1 **Q.   HOW ARE YOU USING THIS METHODOLOGY TO DERIVE AN EX ANTE**

2 **EXPECTED EQUITY RISK PREMIUM?**

3 A.   The third column in the graph above shows current inputs to estimate an ex ante expected

4 market return. These inputs include the following:

5   CPI – To assess expected inflation, I have employed expectations of the short-term and

6 long-term inflation rate. The graph below shows the expected annual inflation rate according to

7 consumers, as measured by the CPI, over the coming year. This survey is published monthly by the

8 University of Michigan Survey Research Center. In the most recent report, expected one-year ahead

9 inflation rate was 3.3%.

10
11
12

Expected Inflation Rate
University of Michigan Consumer Research
(Data Source: http://research.stlouisfed.org/fred2/series/MICH/98)
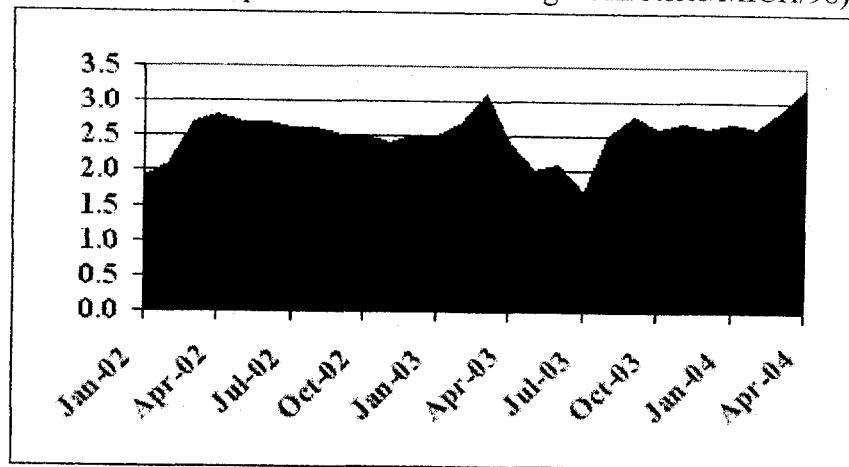
13
14
15 Longer term inflation forecasts are available in the Federal Reserve Bank of Philadelphia's

1   publication entitled *Survey of Professional Forecasters*.[14]   This survey of professional

2   economists has been published for almost 50 years. While this survey is published quarterly,

3   only the first quarter survey includes long-term forecasts of GDP growth, inflation, and market

4   returns. In the first quarter, 2004 survey, published on February 23, 2004, the median long-term

5   (10-term) expected inflation rate as measured by the CPI was 2.50% (see page 4 of

6   Exhibit_(JRW-8)).

7   Given these results, I will use the average of the University of Michigan and Philadelphia

8   Federal Reserve's surveys (3.30% and 2.50%), or 2.90%.

9   D/P – As shown in the graph below, the dividend yield on the S&P 500 has decreased

10   gradually over the past decade. Today, it is far below its norm of 4.3% over the 1926-2000 time

11   period. Whereas the S&P dividend yield bottomed out at less than 1.4% in 2000, it is currently

12   at 2.2% which I use in the ex ante risk premium analysis.

13

14

15

16

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[14]Federal Reserve Bank of Philadelphia, *Survey of Professional Forecasters*, February 23, 2004. 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.

1

S&P 500 Dividend Yield

(Data Source: http://www.barra.com/Research/fund_charts.asp)

Dividend Yield
S&P 500

3.5	
2.8	
2.1	
1.4	
0.7	
0.0	

08/91 04/93 12/94 08/96 04/98 12/99 08/01 04/03
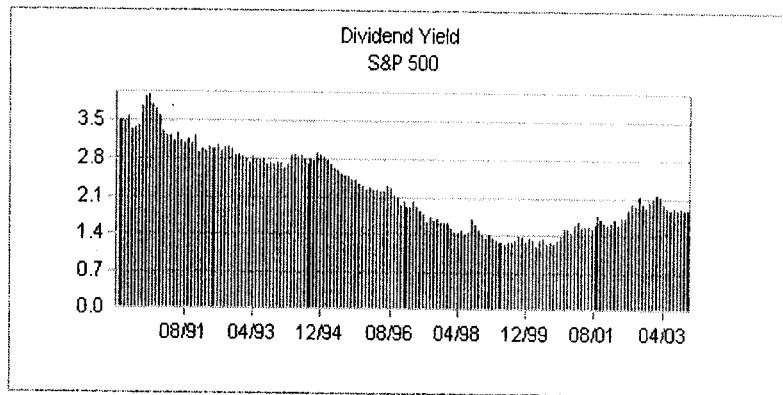
5
6

7   RG – To measure expected real growth in earnings, I use (1) the historic real earnings

8   growth rate for the S&P 500, and (2) expected real GDP growth. The S&P 500 was created in

9   1960. It includes 500 companies which come from ten different sectors of the economy. Over

10 the 1960-2003 period, nominal growth in EPS for the S&P 500 was 6.88%. On page 5 of

11 Exhibit_(JRW-8), real EPS growth is computed using the CPI as a measure of inflation. As

12 indicated by Ibbotson and Chen, real earnings growth over the 1926-2000 period was 1.8%. The

13 real growth figure over 1960-2003 period for the S&P 500 is 2.5%.

14   The second input for expected real earnings growth is expected real GDP growth. The

15 rationale is that over the long-term, corporate profits have averaged a relatively consistent 5.50%

1   of US GDP.[15] Real GDP growth, according to McKinsey, has averaged 3.5% over the past 80

2   years. Expected GDP growth, according to the Federal Reserve Bank of Philadelphia's *Survey of*

3   *Professional Forecasters*, is 3.4% (see page 4 of Exhibit_(JRW-8)).

4   Given these results, I will use the average of the historic S&P EPS real growth and the

5   historic real GDP growth (and as supported by the Philadelphia Federal Reserve survey of expected

6   GDP growth) (2.5% and 3.5%), or 3.0%, for real earnings growth.

7   PEGAIN – the repricing gains associated with increases in the P/E ratio accounted for 1.3%

8   of the 10.7% annual stock return in the 1926-2000 period. In estimating an ex ante expected stock

9   market return, one issue is whether investors expect P/E ratios to increase from their current levels.

10 The graph below shows the P/E ratios for the S&P 500 over the past 25 years. The run-up and

11 eventual peak in P/Es is most notable in the chart. The relatively low P/E ratios (in the range of 10)

12 over two decades ago are also quite notable. As of August, 2004 the P/E for the S&P 500, using the

13 trailing 12 months EPS, is in the range of 21.0 to 22.0 according to www.investor.reuters.com.

14   Given the current economic and capital markets environment, I do not believe that

15 investors expect even higher P/E ratios. Therefore, a PEGAIN would not be appropriate in

16 estimating an ex ante expected stock market return. There are two primary reasons for this.

17 First, the average historic S&P 500 P/E ratio is 15 – thus the current P/E exceeds this figure by

18 nearly 50%. Second, as previously noted, interest rates are at a cyclical low not seen in almost 50

19 years. This is a primary reason for the high current P/Es. Given the current market environment

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[15]Marc H. Goedhart, Timothy M. Koller, and Zane D. Williams, "The Real Cost of Equity," *McKinsey on Finance*

1   with relatively high P/E ratios and low relative interest rate, investors are not likely to expect to

2   get stock market gains from lower interest rates and higher P/E ratios.

3   **S&P 500 P/E Ratios**

4   (Data Source: http://www.barra.com/Research/fund_charts.asp)

Price/Earnings (Incl Negative)
S&P 500
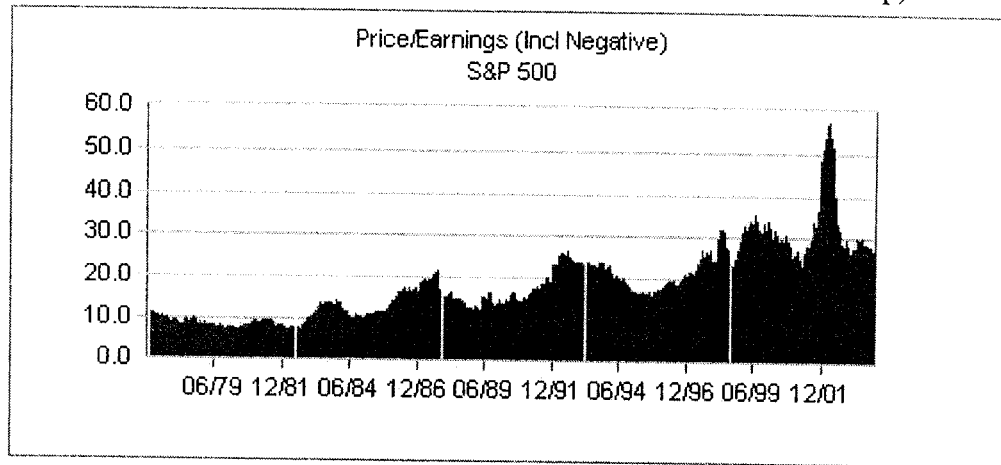
5
6

7   **Q.   GIVEN THIS DISCUSSION, WHAT IS YOUR EX ANTE EXPECTED MARKET**

8   **RETURN AND EQUITY RISK PREMIUM USING THE "BUILDING BLOCKS**

9   **METHODOLOGY"?**

10   A.   My expected market return is represented by the last column on the right in the graph

11   entitled "Decomposing Equity Market Returns: The Building Blocks Methodology" found earlier

12   in my testimony. I believe that the appropriate expected market return is 8.1% which is

13   composed of 2.90% expected inflation, 2.20% dividend yield, and 3.00% real earnings growth

14   rate.

(Autumn 2002), p.14. Available at http://www.corporatefinance.mckinsey.com/.

1 Q. GIVEN THAT THE HISTORIC COMPOUNDED ANNUAL MARKET RETURN

2 IS IN EXCESS OF 10%, WHY DO YOU BELIEVE THAT YOUR EXPECTED MARKET

3 RETURN OF 8.1% IS REASONABLE?

4 A. As discussed above in the development of the expected market return, stock prices are

5 relatively high at the present time in relation to earnings and dividends and interest rates are

6 relatively low. Hence, it is unlikely that investors are going to experience high stock market

7 returns due to higher P/E ratios and/or lower interest rates. In addition, as shown in the

8 decomposition of equity market returns, whereas the dividend portion of the return was

9 historically 4.3%, the current dividend yield is only 2.2%. Due to these reasons, lower market

10 returns are expected for the future.

11 Q. IS YOUR EXPECTED MARKET RETURN OF 8.1% CONSISTENT WITH THE

12 FORECASTS OF MARKET PROFESSIONALS?

13 A. Yes. The only survey of market professionals dealing with forecasts of stock market

14 returns is published by the previously-referenced Federal Reserve Bank of Philadelphia. In the

15 first quarter, 2004 survey, published on February 23, 2004, the median long-term expected return

16 on the S&P 500 was 7.75% (see page 4 of Exhibit_(JRW-8)). This is clearly consistent with my

17 expected market return of 8.1%.

18 Q. GIVEN THIS EXPECTED MARKET RETURN, WHAT IS YOUR EX ANTE

19 EQUITY RISK PREMIUM USING THE "BUILDING BLOCKS METHODOLOGY"?

1 A. Previously I noted that I am using a risk-free interest rate of 4.50%. My ex ante equity risk

2 premium is simply the expected market return from the "building blocks methodology" minus this

3 risk-free rate:

4   Ex Ante Equity Risk Premium   =   8.10% - 4.50%   = 3.60%

5 Q. **WHAT EQUITY RISK PREMIUM ARE YOU USING IN YOUR CAPM?**

6 A. I am employing the average of the Derrig-Orr mean (4.00%) and my building blocks

7 approach (3.60%), or 3.80%.

8 Q. **IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**

9 **EQUITY RISK PREMIUMS OF LEADING INVESTMENT FIRMS?**

10 A. Yes. One of the first studies in this area was by Stephen Einhorn, one of Wall Street's

11 leading investment strategists.[16] His study showed that the market or equity risk premium had

12 declined to the 2.0 to 3.0 percent range by the early 1990s. Among the evidence he provided in

13 support of a lower equity risk premium is the inverse relationship between real interest rates

14 (observed interest rates minus inflation) and stock prices. He noted that the decline in the market

15 risk premium has led to a significant change in the relationship between interest rates and stock

16 prices. One implication of this development was that stock prices had increased higher than would

17 be suggested by the historic relationship between valuation levels and interest rates.

18   The equity risk premiums of some of the other leading investment firms today support the

---

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

1 result of the academic studies. An article in *The Economist* indicated that some other firms like J.P.

2 Morgan are estimating an equity risk premium for an average risk stock in the 2.0 to 3.0 percent

3 range above the interest rate on U.S. Treasury bonds.[17]

4 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**

5 **EQUITY RISK PREMIUMS USED BY CORPORATE CHIEF FINANCIAL OFFICERS**

6 **(CFOs)?**

7 A. Yes. John Graham and Campbell Harvey of Duke University survey CFOs to ascertain their

8 ex ante equity risk premium. In Graham and Harvey's 2003 survey, the average ex ante 10-year

9 equity risk premium of the CFOs was 3.8%.[18]

10 **Q. IS YOUR EX ANTE EQUITY RISK PREMIUM CONSISTENT WITH THE**

11 **EQUITY RISK PREMIUMS USED BY THE LEADING CONSULTING FIRMS?**

12 A. Yes. McKinsey & Co. is widely recognized as the leading management consulting firm in

13 the world. They recently published a study entitled "The Real Cost of Equity" in which they

14 developed an ex ante equity risk premium for the US. In reference to the decline in the equity risk

15 premium, as well as what is the appropriate equity risk premium to employ for corporate valuation

16 purposes, the McKinsey authors concluded the following:

17   We attribute this decline not to equities becoming less risky (the
18   inflation-adjusted cost of equity has not changed) but to investors
19   demanding higher returns in real terms on government bonds after

---

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

[18] John R. Graham and Campbell Harvey, "Expectations of Equity Risk Premia, Volatility, and Asymmetry," Duke University Working Paper, 2003.

1 the inflation shocks of the late 1970s and early 1980s. We believe
2 that using an equity risk premium of 3.5 to 4 percent in the current
3 environment better reflects the true long-term opportunity cost of
4 equity capital and hence will yield more accurate valuations for
5 companies.[19]
6
7 **Q.   WHAT EQUITY COST RATE IS INDICATED BY YOUR CAPM ANALYSIS?**

8 A.   This is summarized on page 1 of Exhibit_(JRW-8). Using a risk-free rate of 4.50% and a

9 beta of 0.65 for the SWC Group and 0.66 for the LWC Group, my CAPM estimated equity cost

10 rates are 6.97% and 7.02%, respectively.

11 SWC Group   4.50% * 0.65 * 3.80% = 6.97%

12 LWC Group   4.50% * 0.66 * 3.80% = 7.02%

13

14 **D. EQUITY COST RATE SUMMARY**

15

16 **Q.   PLEASE SUMMARIZE YOUR EQUITY COST RATE STUDY.**

17 A.   My DCF and CAPM analyses for the SWC Group indicate equity cost rates of 8.89% and

18 6.97%. These results are supported by my DCF and CAPM equity cost rate estimates for the LWC

19 Group, which are 8.74% and 7.02%.

20 **Q.   GIVEN THESE RESULTS, WHAT EQUITY COST RATE RECOMMENDATION**

21 **ARE YOU MAKING FOR KAWC?**

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[19]Marc H. Goedhart, Timothy M. Koller, and Zane D. Williams, "The Real Cost of Equity," *McKinsey on Finance* (Autumn 2002), p.15. Available at http://www.corporatefinance.mckinsey.com/.

1   A.   Since I primarily employ the DCF model to estimate an equity cost rate, I am

2   recommending the DCF equity cost rate of 8.75% for KAWC.

3   **Q.   ISN'T YOUR RECOMMENDED RETURN LOW BY HISTORIC STANDARDS?**

4   A.   Yes it is, and appropriately so. My recommended rate of return is low by historic standards

5   for three reasons. First, as discussed above, current capital costs are very low by historic standards,

6   with interest rates at a cyclical low not seen since the 1960s. Second, the 2003 tax law, which

7   reduces the tax rates on dividend income and capital gains, lowers the pre-tax return required by

8   investors. And third, as discussed below, the equity or market risk premium has declined.

9   **Q.   FINALLY, PLEASE DISCUSS THIS RECOMMENDATION IN LIGHT OF**

10   **RECENT YIELDS ON 'A' RATED PUBLIC UTILITY BONDS AND KAWC'S**

11   **EMBEDDED COST OF LONG-TERM DEBT.**

12   A.   In recent months the yields on 'A' rated public utility bonds have been in the 6.0 percent

13   range. In addition, KAWC's embedded long-term debt cost rate is 6.33%. My equity return

14   recommendation of 8.75% may appear to be too low given these yields. However, my

15   recommendation must be viewed in the context of the significant decline in the market or equity

16   risk premium. As a result, the return premium that equity investors require over bond yields is

17   much lower than today. This decline was previously reviewed in my discussion of capital costs in

18   today's markets. In addition, it will be examined in more depth in my critique of Dr. Vander

19   Weide's testimony

20   In terms of KAWC's embedded cost of long-term debt, it must be remembered that this cost

1 rate is an embedded cost rate and reflects debt that was issued in the past at somewhat higher

2 interest rates. Therefore, it is not appropriate to compare the embedded debt cost rate with the

3 current equity cost rate.

4 **Q.   HOW DO YOU TEST THE REASONABLENESS OF YOUR 8.75%**

5 **RECOMMENDATION?**

6 A.   To test the reasonableness of my 8.75% recommendation, I have examined the relationship

7 between the return on common equity and the market-to-book ratios for the water group.

8 **Q.   WHAT DO THE RETURNS ON COMMON EQUITY AND MARKET-TO-BOOK**

9 **RATIOS FOR THE GROUP INDICATE ABOUT THE REASONABLENESS OF YOUR**

10 **8.75% RECOMMENDATION?**

11 A.   Exhibit_(JRW-3) provides financial performance and market valuation statistics for the two

12 water groups. The average current return on equity and market-to-book ratio for the SWC Group

13 are 8.7% and 2.22, respectively. The same figures for the LWC Group are 9.1% and 1.94. Both of

14 these results clearly indicate that, on average, these companies are earning returns on equity

15 significantly above their equity cost rates.   As such, this observation provides evidence that my

16 recommended equity cost rate of 8.75% is reasonable and fully consistent with the financial

17 performance and market valuation of the water group.

18

19

20

V. CRITIQUE OF KAWC'S RATE OF RETURN TESTIMONY

Q. PLEASE SUMMARIZE KAWC'S OVERALL RATE OF RETURN RECOMMENDATION.

A.   KAWC's rate of return of return recommendation is provided in two stages. Michael A. Miller recommends a capital structure consisting of 3.719% short-term debt, 51.376% long-term debt, 3.78% preferred stock, and 41.125% common equity as well as a short-term debt cost rate of 2.70%, a long-term debt cost rate of 6.33%, and a preferred stock rate of 7.22%. Dr. Vander Weide recommends a common equity cost rate of 11.2%. KAWC's overall recommendation is summarized below:

Capital Source	Ratio	Cost Rate	Weighted Cost Rate
S-T Debt	3.719%	2.700%	0.10%
L-T Debt	51.376%	6.330%	3.25%
Preferred Stock	3.780%	7.720%	0.29%
Common Equity	41.125%	11.20%	4.61%
Cost of Capital			9.36%

Whereas I have adopted Mr. Miller's senior capital cost rates, I have adjusted his capital structure to reflect the fact that KAWC typically employs more short-term debt financing than it has proposed in this proceeding. My recommended equity cost rate of 8.75% is also below Dr. Vander Weide's recommendation of 11.2. In my critique of the Company 's testimony, I focus on the differences in our assessments of the appropriate equity cost rate for KAWC.

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

1   **APPROACHES.**

2   A.   Dr. Vander Weide estimates an equity cost rate for KAWC by applying three equity cost

3   rate models to a group of water service companies and a group of Local Gas Distribution

4   Companies ("LDCs"). His water group includes American States Water Company, Aqua America,

5   Inc., California Water Service Group, Middlesex Water Company, Southwest Water Company, and

6   the York Water Company. The LDC group includes twelve LDCs. His equity cost rate approaches

7   include a DCF model, and an ex ante risk premium model, and an ex post historic risk premium

8   model. His equity cost rate estimates are summarized below:

9   Summary of Approaches and Results
10

	Water Group	LDC Group
DCF	10.70 %	10.70%
Ex Ante Risk Premium		11.45%
Ex Post Risk Premium		11.40%

11
12 Based on these figures, he arrives at an equity cost rate estimate for KAWC of 11.20%.

13   The primary errors in Dr. Vander Weide's equity cost rate studies are (1) excessive and

14 unjustifiable DCF growth rates for his Water and LDC Groups, (2) an adjustment to his DCF and

15 risk premium estimates to reflect the flotation costs; and (3) upwardly biased ex ante and ex post

16 risk premium studies. I also believe that he has erred (a) in his choice of companies for his Water

17 Group and (b) by using a group of LDCs to estimate KAWC's equity cost rate. These errors are

18 discussed in detail below.

19 **Q.   INITIALLY, PLEASE ADDRESS YOUR CONCERNS WITH THE**

20 **COMPOSITION OF DR. VANDER WEIDE'S GROUP OF WATER SERVICE**

1 **COMPANIES.**

2 A.   Dr. Vander Weide's Water Group includes six water service companies. The table below

3 compares Dr. Vander Weide's group of water service companies with my SWC Group. Dr. Vander

4 Weide's group is much larger than KAWC and has a significant presence in California. In addition,

5 his group includes Southwest Water Co., which only receives 33% of its revenues from water

6 operations.

	Kentucky-American Water Co.	SWC Group	Dr. Vander Weide's Group
Number of Companies	1	5	6
Operating Revenue	43.5	39.1	191.4
Net Plant	206.5	147.9	551.5
Service Territory	KY	DE, NJ, PA, NH, CT	NJ, PA, PA, CA,CA CA, NJ

7

8 Q.   WHY IS IT INAPPROPRIATE FOR DR. VANDER WEIDE TO USE A GROUP OF

9 LOCAL DISTRIBUTION GAS COMPANIES TO ESTIMATE KAWC'S EQUITY COST

10 RATE?

11 A.   Dr. Vander Weide has also employed a group of twelve LDC's to estimate KAWC's equity

12 cost rate. This is not appropriate. The business risks of the natural gas business are greater than the

13 water business. For example, demand for natural gas is more weather sensitive, and other fuels

14 compete with natural gas. Furthermore, the group that Dr. Vander Weide has used is especially

15 inappropriate because they are not even pure LDCs. As shown below, the group, on average, only

16 receives 64% of their revenues from gas operations. Hence, using this group is entirely

17 inappropriate.

Dr. Vander Weide's LDC Group
Percent of Revenues from Gas

Company	Percent of Revenues from Gas
AGl Resources	78
Atmos Energy	46
Energen Corp.	63
Equitable Resources	60
KeySpan Corp.	61
New Jersey Resources	35
NICOR Inc.	88
Northwest Natural Gas	99
Peoples Energy	69
Southwest Gas	85
UGI Corp.	16
WGL Holdings	62
Average	**64%**

Source: *C.A. Turner Utility Reports*, August, 2004.

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

A. Dr. Vander Weide's estimates an equity cost rate for KAWC by applying the DCF model to

his water and gas company groups. The dividend yields for his DCF analysis, which are adjusted

upwards to reflect the quarterly payment if dividends and for flotation costs, are:

	Water Group	LDC Group
Adjusted Dividend Yield	3.4%	5.1%

For the growth component of the DCF, Dr. Vander Weide uses one measure of expected growth –

the projected 5-year EPS growth rates for the water and LDC companies as published by I/B/E/S.

These growth rates are:

	Water Group	LDC Group
DCF Growth Rate	7.3%	5.6%

1   The sum of the adjusted dividend yield and the growth rate provide the equity cost rate estimate

2   using the DCF model. His estimates for the two groups are:

	Water Group	LDC Group
DCF Equity Cost Rate	10.7%	10.7%

3

4   **Q.   PLEASE EXPRESS YOUR CONCERNS WITH DR. VANDER WEIDE'S DCF**

5   **STUDY.**

6   A.   Beyond my previously-discussed concerns on the composition of the Water Group and the

7   use of the LDC Group, I have three major concerns with Dr. Vander Weide's DCF equity cost rate

8   study: (1) quarterly model, (2) flotation cost adjustment, and (3) his biased and unjustifiable DCF

9   growth rates.

10   **Q.   PLEASE DISCUSS DR. VANDER WEIDE'S ADJUSTMENT TO THE DIVIDEND**

11   **YIELD TO REFLECT THE QUARTERLY PAYMERN OF DIVIDENDS.**

12   A.   Dr. Vander Weide adjusts the dividend yield term of his DCF model to reflect the

13   quarterly timing of dividend payments. This adjustment procedure is described in Appendix 1 of

14   his testimony. The quarterly timing adjustment is in error and results in an overstated equity cost

15   rate. First, as indicated in the previously cited testimony of Dr. Myron Gordon before the FCC,

16   the appropriate dividend yield adjustment for growth in the DCF model is the expected

17   dividend for the next quarter multiplied by four. Dr. Vander Weide's procedure is clearly

18   inconsistent with this approach. Second, as discussed previously, a DCF–derived equity cost

19   rate is overstated when the overall cost of capital is applied to a projected or end-of-future-test-year

1   rate base. In this situation, both the dividend yield and the growth component are overstated

2   because the equity cost rate (computed using current market data) is applied to a future or

3   test-year-end rate base which includes growth associated with the retention of earnings during the

4   year. Finally, the notion that an adjustment is required to reflect the quarterly timing issue is

5   refuted in a study by Richard Bower of Dartmouth College. Bower acknowledges the timing

6   issue and downward bias addressed by Dr. Vander Wide. However, he demonstrates that this

7   does not result in a biased required rate of return. He provides the following assessment: [20]

8   "... authors are correct when they say that the conventional cost of equity
9   calculation is a downward-biased estimate of the market discount rate.
10   They are not correct, however, in concluding that it has a bias as a
11   measure of required return. As a measure of required return, the
12   conventional cost of equity calculation (K^*), ignoring quarterly
13   compounding and even without adjustment for fractional periods, serves
14   very well."
15

16 He also makes the following observation on the issue:
17

18   "Too many rate cases have come and gone, and too many utilities have
19   survived and sustained market prices above book, to make downward
20   bias in the conventional calculation of required return a likely reality."
21

22 **Q.   PLEASE REVIEW DR. VANDER WEIDE'S FLOTATION ADJUSTMENT.**

23 A.   In Appendix 2 Dr. Vander Weide provides the justification for his adjustment to the

24 Company's allowed rate of return to cover equity flotation costs. To account for flotation costs,

25 he adopts the so-called 'Patterson Approach' which he claims increases the cost of equity by

---

[20] See Richard Bower, The N-Stage Discount Model and Required Return: A Comment," <u>Financial Review</u>

1   about 30 basis points.

2   **Q.   IS A FLOTATION COST ADJUSTMENT NECESSARY?**

3   A.   No. In fact, Dr. Vander Weide effectively answered that question in responding to the

4   Office of Attorney General's Data Requests 31, 32, 33, and 34. In those responses, Dr. Vander

5   Weide acknowledged that neither KAWC or its parent (1) has issued common stock in the past

6   five years and (2) has no plans to issuer common stock over the coming year. Therefore there is

7   no reason to provide KAWC with additional revenues through a flotation cost adjustment to the

8   allowed rate of return. Hence, a flotation cost adjustment to reflect direct or indirect issuance

9   costs would simply provide additional revenues for an expense that neither the Company nor

10 its parent has incurred in the recent past or expects to incur in the foreseeable future.

11 **Q.   PLEASE CRITIQUE DR. VANDER WEIDE'S DCF GROWTH RATE ESTIMATES**

12 **FOR HIS WATER GROUP.**

13 A.   The growth rate estimates for the Water and LDC Groups are upwardly biased because he

14 has employed only one indicator of expected growth - analysts' forecasts of EPS growth - and only

15 one source of these forecasts – I/B/E/S. He has ignored all other indicators of expected growth,

16 especially historic growth. It seems highly unlikely that investors today would rely exclusively on

17 the forecasts of securities analysts, and ignore historic growth, in arriving at expected growth. In

18 the academic world, the fact that the EPS forecasts of securities' analysts are overly optimistic and

19 biased upwards has been known for years.

(February 1992), pp 141-9.

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

2   A.   Analysts' growth rate forecasts are collected and published by Zacks, First Call, I/B/E/S,

3   and Reuters. These services retrieve and compile EPS forecasts from Wall Street Analysts. These

4   analysts come from both the sell side (Merrill Lynch, Paine Webber) and the buy side (Prudential

5   Insurance, Fidelity).

6   To demonstrate the magnitude of the bias, I have compared the actual five-year EPS

7   growth for the S&P 500 with the average forecasted EPS growth rate of Wall Street analysts over

8   the past 20 years. The graph below shows analysts' 5-year EPS growth rate forecasts for the

9   S&P 500. Analysts' forecasts for EPS growth for the S&P 500 hovered in the 11.5% range until

10   1995. These projections then increased dramatically over the next five years (to almost 19.0% by

11   the year 2000) as analysts helped propel the Internet stock market bubble. Forecasted growth has

12   since declined to the 12.0% range.

13
14   **Analysts Forecasted 5-Year EPS Growth for the S&P 500**
     1985-2003
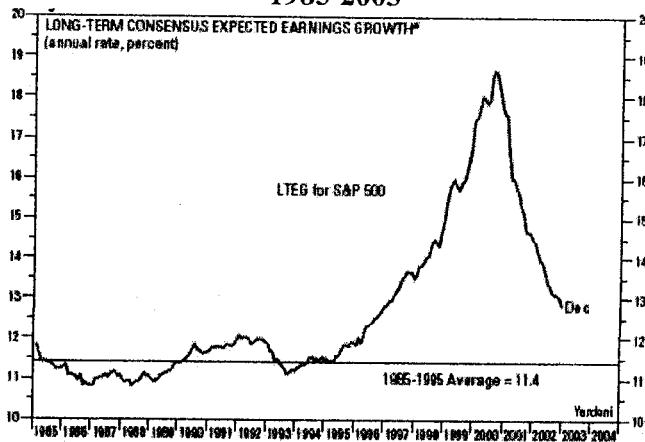
15
16   Source: Edward Yardeni, "Stock Valuation Models (4.1), Topical
17   Study No. 58, Prudential Financial (January, 2003).

1   Meanwhile, companies have been unable to live up to the optimistic forecasts of analysts.

2 In the table and graph below, I have superimposed the analysts' forecasted EPS growth from the

3 graph above, on the actual 5-year EPS growth that the S&P 500 firms produced. For example, in

4 1995, analysts were projecting 5-Year compounded annual EPS growth of about 11.75%, but

5 companies only generated annual compounded EPS growth over the next five years of 8.02%.

6 Over the entire time period, Wall Street analysts have continually forecasted 5-year EPS growth

7 for the S&P 500 in the 11-16 percent range, but these firms have delivered EPS growth in the 7.0

8 percent range. The only years when firms met analysts' expectations were in the early 1990s.

9 Over the entire period, on average, analysts' 5-year forecasted EPS growth was 12.74% per year,

10 but companies only produced 5-year EPS growth of 6.82%. Therefore, the bias is obvious and

11 significant.

12
13   **Actual Versus Forecasted 5-Year EPS Growth for the S&P 500**
                                   1985-2003

	Actual 5-Year S&P 500 EPS Growth	Analysts Projected 5-Year S&P 500 EPS Growth
1985	6.75%	11.50%
1986	5.77%	10.75%
1987	2.48%	11.00%
1988	-2.74%	11.15%
1989	2.40%	11.35%
1990	10.23%	11.75%
1991	13.37%	12.00%
1992	16.89%	12.10%
1993	14.04%	11.65%
1994	10.80%	11.50%
1995	8.02%	11.75%
1996	4.33%	12.50%
1997	3.61%	13.25%
1998	7.21%	14.50%
1999	4.64%	16.25%
2000	1.36%	18.50%
2001		14.75%
2002		13.50%
2003		12.25%
Mean	6.82%	12.74%

14

1 **Q. WHAT OTHER OBSERVATIONS DO YOU HAVE ABOUT WALL STREET**

2 **ANALYSTS AND THEIR PROJECTIONS?**

3 A. The value of Wall Street research has diminished in the wake of New York Attorney

4 General Elliot Spitzer's investigation and the fact that nine major brokerage firms have paid over

5 $1.5B in the Global Research Regulatory Settlement. With these admitted biases in analysts'

6 research, it seems highly unlikely that investors today would focus squarely on the forecasts of

7 securities analysts in arriving at expected growth. Clearly, investors have learned to be suspicious

8 of the upwardly biased forecasts and stock recommendations of securities analysts.

9 **Q. DO YOU BELIEVE THAT THE CRACKDOWN ON WALL STREET FIRMS**

10 **HAS LED TO MORE HONEST AND LESS BIASED FORECASTS AND**

11 **RECOMMENDATIONS?**

12 A. No. The fact is that analysts continue to provide overly positive outlooks for their stocks.

13 Two *Wall Street Journal* articles focus on this very issue. The first article is titles, "Stock Analysts

14 Still Put Their Clients First," and highlights the fact that that despite the recent reforms, analysts

15 still give higher ratings to companies that employ their firms for investment banking services.[21] In

16 the second article, the title says it all -- "Analysts Still Coming Up Rosy – Over-Optimism on

17 Growth Rates is Rampant – and the Estimates Help to Buoy the Market's Valuation." The

18 following quote provides insight into the continuing bias in analysts' forecasts:

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[21] Randall Smith,"Stock Analysts Still Put Their Clients First" *Wall Street Journal*, (April 7, 2003), p. C1.

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

5 These overly optimistic growth estimates also show that, even with
6 all the regulatory focus on too-bullish analysts allegedly influenced
7 by their firms' investment-banking relationships, a lot of things
8 haven't changed: Research remains rosy and many believe it always
9 will.[22]

10

11 **Q. DO YOU HAVE ANY OTHER CONCERNS WITH DR. VANDER WEIDE'S USE**

12 **OF ANALYSTS' EPS PROJECTIONS?**

13 A. While the big issue is the obvious bias in these projections, it is also noteworthy that he has

14 used only one source - I/B/E/S – which is not available on the Internet and is not free-of-charge like

15 other services. Inn Exhibit_(JRW-9), I have provided the analysts' 5-year EPS projections from

16 three free Internet services – Zacks, Reuters, and Yahoo for the Dr. Vander Weide's water group

17 (page 1) and LDC group (page 2). The average projected EPS growth rate for both groups from

18 these services are below the figures used by Dr. Vander Weide.

19 **Q. DR. VANDER WEIDE HAS DEFENDED THE USE OF ANALYSTS' EPS**

20 **FORECASTS IN HIS DCF MODEL BY CITING A STUDY HE PUBLISHED WITH DR.**

21 **WILLARD CARLETON. PLEASE DISCUSS DR. VANDER WEIDE'S STUDY.**

22 A. Dr. Vander Weide provided a copy of the study in response to Office of Attorney General

23 Data Request No. 30. In the study, Dr. Vander Weide performs a linear regression of a company's

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[22] 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.

1   stock price to earnings ratio (P/E) on the dividend yield payout ratio (D/E), alternative measures of

2   growth (g), and three measures of risk (beta, covariance, r-squared, and the standard deviation of

3   analysts' growth rate projections). He performed the study for three one-year periods -- 1981-1982,

4   and 1983 -- and used a sample of approximately 65 companies. His results indicated that

5   regressions measuring growth as analysts' forecasted EPS growth were more statistically significant

6   that those using various historic measures of growth. Consequently, he concluded that analysts'

7   growth rates are superior measures of expected growth.

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

9   A.   Before highlighting the errors in the study, it is important to note that the study was

10   published fifteen years ago, used a sample of only sixty five companies, and evaluated a three-year

11   time period (1981-93) that was over twenty years ago. Since that time, many more exhaustive

12   studies have been performed using significantly larger data bases and, from these studies, much has

13   been learned about Wall Street analysts and their stock recommendations and earnings forecasts.

14   Nonetheless, there are several errors that invalidate the results of the study.

15   The primary error in the study is that his regression model is misspecified. As a result, he

16   cannot conclude whether one growth rate measure is better than the other. The misspecification

17   results from the fact that Dr. Vander Weide did not actually employ a modified version of the DCF

18   model. Instead, he used a "linear approximation." He used the approximation so that he did not

19   have to measure k, investors' required return, directly, but instead he used some proxy variables for

20   risk. The error in this approach is there can be an interaction between growth (g) and investors'

1   required return (k) which could lead him to conclude that one growth rate measure is superior to

2   others. Furthermore, due to this problem, analysts' EPS forecasts could be upwardly biased and

3   still appear to provide better measures of expected growth.

4   There are other errors in the study as well that further invalidate the results. Dr. Vander

5   Weide does not use both historic and analysts' projections growth rate measures in the same

6   regression to assess if both historic and forecasts should be used together to measure expected

7   growth. In addition, he did not perform any tests to determine if the difference between historic and

8   projected growth measures is statistically significant. Without such tests, he cannot make any

9   conclusions about the superiority of one measure versus the other.

10   **Q.   PLEASE SUMMARIZE YOUR ASSESSMENT OF DR. VANDER WEIDE'S DCF**

11   **GROWTH RATE.**

12   A.   The growth rate estimates for the Water and LDC Groups are upwardly biased because he

13   has relied solely on analysts' forecasts of EPS growth to measure a DCF growth rate. He has

14   ignored all other indicators of growth to measure investors' expectations. As demonstrated and

15   discussed above, it is well known that analysts' EPS growth rate forecasts are upwardly biased

16   measures of actual growth. Hence, it is highly unlike that investors would simply look to these

17   biased forecasts as the only measures of expected growth.

18   One other observation is worth noting. In the DCF model, investors are presumed to be

19   forecasting and discounting future dividends per share. *Value Line's* projected dividend growth

20   rate for the Dr. Vander Weide's Water and LDC Groups are only 3.2% and 4.1%, respectively. He

1 gave no weight to this growth rate indicator, which is especially significant *since the relevant*

2 *growth variable in the DCF model is dividends.*

3 **Q. PLEASE REVIEW DR. VANDER WEIDE'S RISK PREMIUM ANALYSES.**

4 A. Dr. Vander Weide performs both ex ante and an ex post risk premium studies. His results

5 are summarized below:

	Ex Ante Risk Premium	Ex Post Risk Premium
'A' Rated Utility Rate	6.16	6.26
Risk Premium	5.29	5.14
Equity Cost Rate	11.45	11.4

6

7 These equity cost estimates are excessive due to an overstated base yield, an ad hoc 25 basis point

8 adjustment for flotation costs and, primarily, biased and inflated equity risk premiums.

9 **Q. PLEASE DISCUSS THE BASE YIELD OF DR. VANDER WEIDE'S RISK**

10 **PREMIUM ANALYSIS.**

11 A. The base yield in Dr. Vander Weide's risk premium analyses is the prospective yield on

12 long-term, 'A' rated public utility bonds. Using the yield on these securities inflates the required

13 return on equity for KAWC in three ways. First, long-term bonds are subject to interest rate risk, a

14 risk which does not affect common stockholders since dividend payments (unlike bond interest

15 payments) are not fixed but tend to increase over time. Second, the base yield in Dr. Vander

16 Weide's risk premium study is subject to credit risk since it is not default risk-free like an obligation

17 of the U.S. Treasury. As a result, its yield-to-maturity includes a premium for default risk and

18 therefore is above its expected return. Hence using such a bond's yield-to-maturity as a base yield

1   results in an overstatement of investors' return expectations.

2   **Q.   PLEASE ADDRESS DR. VANDER WEIDE'S FLOTATION ADJUSTMENT.**

3   A.   Dr. Vander Weide makes a 25 basis point adjustment for flotation costs in his risk

4   premium analysis. As previously discussed, such an adjustment in inappropriate since neither

5   KAWC or its parent plans to issue equity in the near future.

6   **Q.   PLEASE REVIEW DR. VANDER WEIDE'S EX ANTE RISK PREMIUM STUDY.**

7   A.   Dr. Vander Weide ex ante risk premium study involves a 68-month study using Dr. Vander

8   Weide's his proxy group of LDCs. He computes expected returns for the LDC Group using the

9   DCF model and estimating the growth rate employing analysts' EPS growth rate forecasts. He then

10   subtracts the rate on 'A' rated public utility bonds. The average risk premium over the entire period

11   is 4.75%. He then adjusts this figure upward to 5.29% due to the inverse relationship between

12   interest rates and risk premiums.

13   **Q.   PLEASE CRITIQUE DR. VANDER WEIDE'S EX ANTE RISK PREMIUM**

14   **STUDY.**

15   A.   There are two primary problems with the study. First, it employs his proxy group of LDC

16   companies. As previously discussed, this group is not appropriate for KAWC, especially given that

17   they are not even pure LDCs. Second, and even more importantly, the study relies exclusively on

18   analysts' EPS forecasts to measure growth for the DCF model. The upwardly biased nature of

19   these forecasts has been discussed at length previously in this testimony.

20   **Q.   PLEASE REVIEW DR. VANDER WEIDE'S EX POST RISK PREMIUM STUDY.**

1 A.   Dr. Vander Weide's ex post risk premium study involves an assessment of the historic

2 difference between the stock returns on the S&P 500 and S&P Public Utility Index and the returns

3 on 'A' rated public utility bonds over the years 1937-2003. He arrives at risk premiums (above 'A'

4 rated public utility bonds) of 5.22% using the S&P 500 returns and 4.61% using the returns on the

5 S&P Public Utility Index.

6 Q.   **INITIALLY PLEASE ADDRESS DR. VANDER WEIDE'S USE OF THE S&P 500**

7 **AND S&P PUBLIC UTILITY INDEX RETURNS TO ESTIMATE A RISK PREMIUM**

8 **FOR KAWC.**

9 A.   Dr. Vander Weide claims that the risk of KAWC is between that of the S&P Public Utilities

10 and the S&P 500. He has provided no evidence to support this claim. In fact, he has provided no

11 evidence that KAWC is even as risky as the S&P Public Utilities. The S&P Public Utilities

12 includes primarily electric and gas companies and does not include any water companies. Absent

13 any studies that compare KAWC's risk to that of the S&P 500 and the S&P Public Utilities, I

14 believe that you must turn to a broader evaluation of industry risk. In Exhibit_(JRW-6), I show the

15 average betas for 100 different industries. Water utilities are the next to lowest risk industry in

16 terms of beta less risky than electric and gas companies and much less risky than the average

17 company. As such, Dr. Vander Weide should be using a risk premium for KAWC that is below the

18 S&P Public Utilities and the S&P 500.

19 Q.   **PLEASE EVALUATE DR. VANDER WEIDE'S USE OF HISTORIC STOCK AND**

20 **BOND RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.**

1 A.   This type of historic evaluation of stock returns is often called the "Ibbotson approach" after

2 Professor Roger Ibbotson who popularized this method of assessing historic financial market

3 returns. Dr. Vander Weide computes the average returns on stocks (the S&P 500 and S&P Public

4 Utility Index) and bonds for the 1927-2003 period.

5 **Q.   PLEASE DISCUSS THE USE OF HISTORIC RETURNS TO COMPUTE A**

6 **FORWARD-LOOKING OR EX ANTE RISK PREMIUM.**

7 A.   As noted, Dr. Vander Weide's has used historic returns to compute an expected risk

8 premium in what is often called the Ibbotson approach. Using the historic relationship between

9 stock and bond returns to measure an ex ante equity risk premium is erroneous and, especially in

10 this case, overstates the true market equity risk premium. The equity risk premium is based on

11 expectations of the future and when past market conditions vary significantly from the present,

12 historic data does not provide a realistic or accurate barometer of expectations of the future.

13 Currently, using historic returns to measure the ex ante equity risk premium masks the dramatic

14 change in the risk and return relationship between stocks and bonds which suggests that the equity

15 risk premium has declined.

16 **Q.   PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND**

17 **RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.**

18 A.   There are a number of flaws in using historic returns over long time periods to estimate

19 expected equity risk premiums. These issues include:

20   (A) Biased historic bond returns;

1   (B) The arithmetic versus the geometric mean return;

2   (C) Unattainable and biased historic stock returns;

3   (D) Survivorship bias;

4   (E) The "Peso Problem;"

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

6   (G) Changes in risk and return in the markets.

7   These issues will be addressed in order.

8   **Biased Historic Bond Returns**

9   **Q.   HOW ARE HISTORIC BOND RETURNS BIASED?**

10   A.   An essential assumption of these studies is that over long periods of time investors'

11   expectations are realized. However, the experienced returns of bondholders in the past violate this

12   critical assumption. Historic bond returns are biased downward as a measure of expectancy

13   because of capital losses suffered by bondholders in the past. As such, risk premiums derived from

14   this data are biased upwards.

15   **The Arithmetic versus the Geometric Mean Return**

16   **Q.   PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE**

17   **ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON**

18   **METHODOLOGY.**

19   A.   The measure of investment return has a significant effect on the interpretation of the risk

20   premium results. When analyzing a single security price series over time (i.e., a time series), the

1 best measure of investment performance is the geometric mean return. Using the arithmetic

2 mean overstates the return experienced by investors. In a study entitled "Risk and Return on

3 Equity: The Use and Misuse of Historical Estimates," Carleton and Lakonishok make the

4 following observation: "The geometric mean measures the changes in wealth over more than one

5 period on a buy and hold (with dividends invested) strategy."[23] Since Dr. Vander Weide's study

6 covers more than one period (and he assumes that dividends are reinvested), he should be

7 employing the geometric mean and not the arithmetic mean.

8 **Q.   PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH**

9 **USING THE ARITHMETIC MEAN RETURN.**

10 68.   To demonstrate the upward bias of the arithmetic mean, consider the following example.

11 Assume that you have a stock (that pays no dividend) that is selling for $100 today, increases to

12 $200 in one year, and then falls back to $100 in two years. The table below shows the prices and

13 returns.

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

14

15   The arithmetic mean return is simply (100% + (-50%))/2 = 25% per year. The geometric

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[23] 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.

1   mean return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Therefore, the arithmetic mean return suggests that

2   your stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an

3   annual return of 0%. Since after two years, your stock is still only worth $100, the geometric mean

4   return is the appropriate return measure. For this reason, when stock returns and earnings growth

5   rates are reported in the financial press, they are generally reported using the geometric mean. This

6   is because of the upward bias of the arithmetic mean. Therefore, Dr. Vander Weide's arithmetic

7   mean return measures are biased and should be disregarded.

8   **Unattainable and Biased Historic Stock Returns**

9   **Q.   YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE**

10   **IBBOTSON METHODOLOGY. PLEASE ELABORATE.**

11   A.   Returns developed using Ibbotson's methodology are computed on stock indexes and

12   therefore (1) cannot be reflective of expectations because these returns are unattainable to investors,

13   and (2) produce biased results. This methodology assumes (a) monthly portfolio rebalancing and

14   (b) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors

15   rebalance their portfolios at the end of each month in order to have an equal dollar amount invested

16   in each security at the beginning of each month. The assumption would obviously generate

17   extremely high transaction costs and, as such, these returns are unattainable to investors. In

18   addition, an academic study demonstrates that the monthly portfolio rebalancing assumption

19   produces biased estimates of stock returns.[24]

---

[24] See Richard Roll, "On Computing Mean Returns and the Small Firm Premium," *Journal of Financial Economics*

1   Transaction costs themselves provide another bias in historic versus expected returns. The

2   observed stock returns of the past were not the realized returns of investors due to the much higher

3   transaction costs of previous decades. These higher transaction costs are reflected through the

4   higher commissions on stock trades, and the lack of low cost mutual funds like index funds.

5   **Survivorship Bias**

6   **Q.   HOW DOES SURVIVORSHIP BIAS TAINT DR. VANDER WEIDE'S HISTORIC**

7   **EQUITY RISK PREMIUM?**

8   A.   Using historic data to estimate an equity risk premium suffers from survivorship bias.

9   Survivorship bias results when using returns from indexes like the S&P 500. The S&P 500

10   includes only companies that have survived. The fact that returns of firms that did not perform so

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

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

13   **The "Peso Problem"**

14   **Q.   WHAT IS THE "PESO PROBLEM" AND HOW DOES IT AFFECT HISTORIC**

15   **RETURNS AND EQUITY RISK PREMIUMS?**

16   A.   Dr. Vander Weide's use of historic return data also suffers from the so-called "peso

17   problem." This issue involves the fact that past stock market returns were higher than were

18   expected at the time because despite war, depression, and other social, political, and economic

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· (1983), pp. 371-86.

1 events, the US economy survived and did not suffer hyperinflation, invasion, and the calamities of

2 other countries. Therefore, historic stock returns are overstated as measures of expected returns.

3 **Market Conditions Today are Significantly Different than in the Past**

4 **Q.   FROM AN EQUITY RISK PREMIUM PERSPECTIVE, PLEASE DISCUSS HOW**

5 **MARKET CONDITIONS ARE DIFFERENT TODAY.**

6 A.   The equity risk premium is based on expectations of the future. When past market

7 conditions vary significantly from the present, historic data does not provide a realistic or

8 accurate barometer of expectations of the future. As noted previously, stock valuations (as

9 measured by P/E) are relatively high and interest rates are relatively low, on a historic basis.

10 Therefore, given the high stock prices and low interest rates, expected returns are likely to be

11 lower on a going forward basis.

12 **Changes in Risk and Return in the Markets**

13 **Q.   PLEASE DISCUSS THE NOTION THAT HISTORIC EQUITY RISK PREMIUM**

14 **STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN TODAY'S**

15 **FINANCIAL MARKETS.**

16 A.   The historic equity risk premium methodology is unrealistic in that it makes the explicit

17 assumption that risk premiums do not change over time. Simply stated, using historic returns to

18 measure the equity risk premium masks the dramatic change in the risk and return relationship

19 between stocks and bonds. The nature of the change is that bonds have increased in risk relative to

20 stocks. This change suggests that the equity risk premium has declined in recent years.

1   Page 1 of Schedule JRW-10 provides the yields on long-term U.S. Treasury bonds from

2   1926 to 2003. One very obvious observation from this graph is that interest rates increases

3   dramatically from the mid-1960s until the early 1980s, and since have returned to their 1960

4   levels. The annual market risk premiums for the 1926 to 2003 period are provided on page 2 of

5   Schedule JRW-10. The annual market risk premium is defined as the return on common stock

6   minus the return on long-term Treasury Bonds. There is considerable variability in this series

7   and a clear decline in recent decades. The high was 54% in 1933 and the low was -38% in 1931.

8   Evidence of a change in the relative riskiness of bonds and stocks is provided on page 3 of

9   Schedule JRW-10 which plots the standard deviation of monthly stock and bond returns since

10   1926. The plot shows that, whereas stock returns were much more volatile than bond returns

11   from the 1920s to the 1970s, bond returns became more variable than stock returns during the

12   1980s. In recent years stocks and bonds have become much more similar in terms of volatility,

13   but stocks are still a little more volatile. The decrease in the volatility of stocks relative to bonds

14   over time has been attributed to several stock related factors: the impact of technology on

15   productivity and the new economy; the role of information (see Federal Reserve Chairman

16   Greenspan's comments referred to earlier in this testimony) on the economy and markets; better

17   cost and risk management by businesses; and several bond related factors; deregulation of the

18   financial system; inflation fears and interest rates; and the increase in the use of debt financing.

19   Further evidence of the greater relative riskiness of bonds is shown on page 4 of Schedule JRW-

20   10, which plots real interest rates (the nominal interest rate minus inflation) from 1926 to 2002.

1   Real rates have been well above historic norms during the past 10-15 years. These high real

2   interest rates reflect the fact that investors view bonds as riskier investments.

3   The net effect of the change in risk and return has been a significant decrease in the return

4   premium that stock investors require over bond yields. In short, the equity or market risk premium

5   has declined in recent years. This decline has been discovered in studies by leading academic

6   scholars and investment firms, and has been acknowledged by government regulators. As such,

7   using a historic equity risk premium analysis is simply outdated and not reflective of current

8   investor expectations and investment fundamentals.

9   **Q.   PLEASE SUMMARIZE YOUR RECOMMENDATIONS CONCERNING DR.**

10   **VANDER WEIDE'S EX POST RISK PREMIUM ANALYSIS.**

11   A.   Dr. Vander Weide's ex post risk premium study is erroneous and should be disregarded in

12   estimating KAWC's equity cost rate. As indicated, the base yield of 6.26% (1) includes interest rate

13   risk, a risk not generally faced by equity investors, (2) is above investors' expected return on public

14   utility bonds. In addition, he employs returns from the S&P 500 and S&P Public Utility Index

15   without demonstrating that KAWC is of a similar risk class. The equity risk premiums of 5.22%

16   using the S&P 500 and 4.61% using S&P Public Utilities are based on a historic risk premium

17   study of stock and bond returns since 1937 that is subject to a myriad of empirical biases that

18   prevents such risk premiums from being reasonable expectations of the expected risk premium.

19   **Q,   TO CONCLUDE THIS DISCUSSION, PLEASE SUMMARIZE DR. VANDER**

20   **WEIDE'S EX ANTE AND EX POST RISK PREMIUM STUDIES IN LIGHT OF THE**

1 EVIDENCE ON RISK PREMIUMS IN TODAY'S MARKETS.

2 A.   The primary issue in both cases is the magnitude of the equity or market risk premium.

3 Dr. Vander Weide's risk premium studies should be totally ignored due to the size of his equity risk

4 premium estimates.   They are totally out of line with the equity risk premium estimates (a)

5 discovered in recent academic studies by leading finance scholars and (b) employed by leading

6 investment banks and management consulting firms as well as corporate CFOs. In both cases, a

7 more realistic market risk premium is in the 2-4 percent range above Treasury yields. Furthermore,

8 even Federal Reserve Chairman Mr. Greenspan believes that the equity risk premium has declined.

9 Q.   DOES THIS CONCLUDE YOUR TESTIMONY?

10 A.   Yes it does.

Appendix A
EDUCATIONAL BACKGROUND, RESEARCH,
AND RELATED BUSINESS EXPERIENCE

J. RANDALL WOOLRIDGE

J. Randall Woolridge is a Professor of Finance and the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration in the College of Business Administration of the Pennsylvania State University in University Park, PA. In addition, Professor Woolridge is Director of the Smeal College Trading Room. He is also a Vice President of the Columbia Group, a public utility consulting firm based in Ridgefield, CT and serves on the Investment Committee of ARIS Corporation, an asset management firm based in State College, PA.

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

Professor Woolridge's research has centered on the theoretical and empirical foundations of corporation finance and financial markets and institutions. He has published over 25 articles in the best academic and professional journals in the field, including the *Journal of Finance,* the *Journal of Financial Economics,* and the *Harvard Business Review.* His research has been cited extensively in the business press. His work has been featured in the *New York Times, Forbes, Fortune, The Economist, Financial World, Barron's, Wall Street Journal, Business Week, Washington Post, Investors' Business Daily, Worth Magazine, USA Today,* and other publications. In addition, Dr. Woolridge has appeared as a guest on CNN's *Money Line* and CNBC's *Morning Call* and *Business Today.*

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

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

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

Pennsylvania: Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Pennsylvania Public Utility Commission:

Bell Telephone Company (R-811819), Peoples Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company (R-832381), Pennsylvania Power Company (R-842740),

Pennsylvania Gas and Water Company (R-850178), Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas of Pennsylvania, Inc. (R-901873), National Fuel Gas Distribution Company (R-911912), Pennsylvania-American Water Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc, (R-932604), National Fuel Gas Distribution Company (R-932548), Commonwealth Telephone Company (I-920020), Conestoga Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain Consolidated Water Company (R-932873), National Fuel Gas Company (R-942991), UGI - Gas Division (R-953297), UGI - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American Water Company (R-994638), Philadelphia Suburban Water Company (R-994868;R-994877;R-994878; R-9948790), Philadelphia Suburban Water Company (R-994868), Wellsboro Electric Company (R-00016356), Philadelphia Suburban Water Company (R-00016750), National Fuel Gas Distribution Company (R-00038168), Pennsylvania-American Water Company (R-00038304).

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

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

Delaware: Dr. Woolridge prepared testimony for the Delaware Division of Public Advocate: Artesian Water Company (R-00-649).

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

Connecticut: Dr. Woolridge prepared testimony for the Office of Consumer Counsel in Connecticut: United Illuminating (Docket No. 96-03-29).

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

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

Kansas: Dr. Woolridge prepared testimony on behalf of the Kansas Citizens' Utility Ratepayer Board Utilities in the following case: Western Resources Inc. (Docket No. 01-WSRE-949-GIE).

FERC: Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following cases before the Federal Energy Regulatory Commission: National Fuel Gas Supply Corporation (RP-92-73-000) and Columbia Gulf Transmission Company (RP97-52-000).

J. Randall Woolridge

Office Address
609-R Business Administration Bldg.
The Pennsylvania State University
University Park, PA 16802
814-865-1160

Home Address
120 Haymaker Circle
State College, PA 16801
814-238-9428

Academic Experience

Professor of Finance, the Smeal College of Business Administration, the Pennsylvania State University (July 1, 1990 to the present).

> **Director, the Smeal College Trading Room** (January 1, 2001 to the present)
> **Goldman, Sachs & Co. and Frank P. Smeal Endowed University Fellow in Business Administration** (July 1, 1987 to the present).

Associate Professor of Finance, College of Business Administration, the Pennsylvania State University (July 1, 1984 to June 30, 1990).

> **Director, the Blankman Strategic Decision-Making Program** (March 1, 1985 to June 30, 1987).

Assistant Professor of Finance, College of Business Administration, the Pennsylvania State University (September, 1979 to June 30, 1984).

Education

Doctor of Philosophy in Business Administration, the University of Iowa (December, 1979). Major field: Finance.

Master of Business Administration, the Pennsylvania State University (December, 1975).

Bachelor of Arts, the University of North Carolina (May, 1973) Major field: Economics.

Books

James A. Miles and J. Randall Woolridge, *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation), 1999

Patrick Cusatis, Gary Gray, and J. Randall Woolridge, *The StreetSmart Guide to Valuing a Stock* (2nd Edition, McGraw-Hill), 2003.

J. Randall Woolridge and Gary Gray, *The New Corporate Finance, Capital Markets, and Valuation: An Introductory Text* (Kendall Hunt, 2003).