BEFORE THE

PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
v.	:	Docket No. R-00038304
Pennsylvania-American Water Company	:	

DIRECT TESTIMONY

OF

DR. J. RANDALL WOOLRIDGE

FOR THE

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

August, 2003

Pennsylvania-American Water Company
Docket No. R-00038304

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

8 experience is provided in Appendix A.

9

10   **I. SUBJECT OF TESTIMONY AND**

11   **SUMMARY OF RECOMMENDATIONS**

12

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

14 A.   I have been asked by the Office of Consumer Advocate ("OCA") to provide an opinion as

15 to the overall fair rate of return for Pennsylvania American Water Company ("PAWC" or

16 "Company") and to evaluate PAWC'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 8.4% for PAWC primarily by applying the Discounted Cash Flow ("DCF")

20 approach to a group of publicly-held water service companies. I have also performed a Risk

1 Premium ("RP") study. Utilizing my equity cost rate, capital structure ratios, and senior capital cost

2 rates, I am recommending an overall fair rate of return for the Company of 6.90%. This

3 recommendation is summarized in Schedule JRW-1.

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

5 **RETURN POSITION.**

6 A.   The Company's rate of return testimony is offered by Mr. Paul R. Moul. Mr. Moul provides

7 a recommendation for the Company's capital structure, senior capital cost rates, equity cost rate, and

8 overall rate of return. The Company's proposed rate of return is inflated due to an inappropriate

9 capital structure and an overstated equity cost rate. Mr. Moul's estimated equity cost rate of

10 11.75% is unreasonably high primarily due to (1) an excessive and unjustifiable expected growth

11 rate he uses in his DCF equity cost rate, (2) outdated and seriously flawed risk premium, Capital

12 Asset Pricing Model ("CAPM") studies, and Comparable Earnings and (3) inappropriate

13 adjustments to his equity cost rate estimate. He has also failed to take into consideration the effect

14 of the *Jobs and Growth Tax Relief Reconciliation Act of 2003* on the return requirements of

15 investors.

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

17 A.   Capital costs are very low by historic standards in the U.S.. That is because of the low

18 interest rates we have today, the decline in the equity or market risk premium, and the new tax law.

19 While I will discuss the decline in the market risk premium at length in the testimony, I do want to

20 highlight the decline in interest rate and the impact of the new tax law.

1   The baseline for capital costs in our economy is the yield on long-term Treasury securities.

2   The yields on long-term Treasury bonds represent the riskless cost of long-term capital, with which

3   the cost of all other risky capital is compared. In Figure 1 below, I have plotted the yields on 10-

4   year Treasury securities for the past 50 years. The 10-year Treasury yield as of June, 2003 was

5   3.3%. This is extremely low by historic standards. In fact, the 10-year Treasury yield has not been

6   as low as 3.3% since July, 1958 – that's 45 years ago!

7   **Figure 1**
8   **Ten-Year Treasury Yields -- 1953-2003**
9
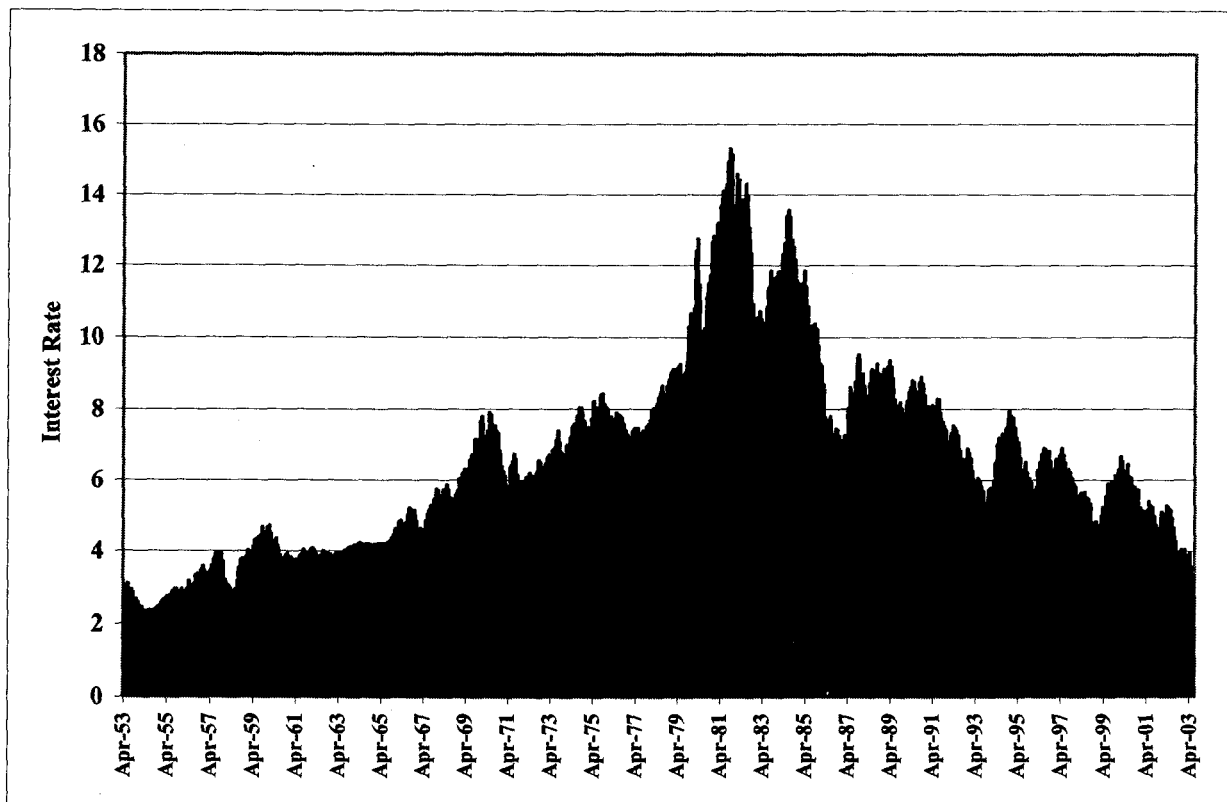
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11

1 **Q.   PLEASE ALSO DISCUSS THE IMPACT OF THE NEW TAX LAW ON THE**

2 **RATE OF RETURN DEBATE IN THIS PROCEEDING.**

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

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

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

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

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

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

9 the implications of the double taxation of dividends is that, all else equal, it results in a high cost

10 of raising capital for corporations.

11   The new tax legislation reduces the effect of double taxation of dividends by lowering the

12 tax rate on dividends from the 30 percent range (the average tax bracket for individuals) to 15

13 percent. This reduction in the taxation of dividends for individuals enhances their after-tax

14 returns and thereby reduces their pre-tax required returns. This reduction in pre-tax required

15 returns (due to the lower tax on dividends) effectively reduces the cost of equity capital for

16 companies. The new tax law also reduced the tax rate on long-term capital gains from 20% to

17 15%.

18   To demonstrate the effect of the new legislation, assume that a utility has a 10% expected

19 return – 5.0% in dividends and 5.0% in capital gains. The new tax law reduces the double-

20 taxation by reducing the tax rate on dividends from the 30 percent range (the marginal tax

-4-

1   bracket for the average individual taxpayer) to 15 percent.   The table below illustrates the effect

2   of the new tax law. Panel A shows that under the old tax law a 10.0% pre-tax return provided for

3   a 7.5% after tax return. Panel B shows that under the new tax law, with tax rates of 15% on both

4   dividends and capital gains, the 10% pre-tax return is worth 8.5% on an after-tax basis. In Panel

5   C, I have held the after-tax return constant (at 7.5%) to illustrate the effect of the new tax law on

6   required pre-tax returns. Assuming that the entire after-tax 1% return difference (7.5% to 8.5%)

7   is attributed to the lower taxation of dividends, the 10.0% pre-tax return under the new law is

8   now only 8.82%. In other words, to generate an after-tax return of 7.5%, the new tax law

9   reduced the required pre-tax return from 10.0% to 8.82%.

10

11   **The Impact of the New Tax Law on Pre- and After- Tax Returns**

Panel A
Old Tax Law
10% Pre-Tax Return - 5% Dividend Yield & 5% Capital Gain
Tax Rates - Dividends 30% & Capital Gains 20%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	5.00%	30.00%	3.50%
Capital Gain	5.00%	20.00%	4.00%
Total	10.00%		7.50%

Panel B
New Tax Law
10% Pre-Tax Return - 5% Dividend Yield & 5% Capital Gain
Tax Rates - Dividends 15% & Capital Gains 15%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	5.00%	15.00%	4.25%
Capital Gain	5.00%	15.00%	4.25%
Total	10.00%		8.50%

Panel C
The Effect of the New Tax Law on Pre-Tax Returns
7.50% After-Tax Return - 3.25% Dividend Yield & 4.25% Capital Gain
Tax Rates - Dividends 15% & Capital Gains 15%

	Pre-Tax Return	Tax Rate	After-Tax Return
Dividends	3.82%	15.00%	3.25%
Capital Gain	5.00%	15.00%	4.25%
Total	8.82%		7.50%

12

13   **Q.   HOW DO YOU RECOMMEND THAT THE COMMISSION ADDRESS THE**

1 **EFFECT OF THE NEW TAX LAW ON THE COST OF EQUITY?**

2 A.   The Commission needs to recognize that the new tax law has reduced the pre-tax return

3 requirements of investors. As such, in setting a rate of return for utilities, a lower pre-tax allowed

4 rate of return produces the same after-tax return to investors. In the example above, a pre-tax

5 required return of 10.0% under the old tax law equates to be 8.82% under the new tax law to

6 produce the same after-tax return.

7

8   **II. COMPARISON GROUP SELECTION**

9

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

11 **RETURN RECOMMENDATION FOR PAWC.**

12 A.   To develop a fair rate of return recommendation for PAWC, I evaluated the return

13 requirements of investors on the common stock of a group of publicly-held water service

14 companies.

15 Q.   **PLEASE DESCRIBE YOUR GROUP OF WATER SERVICE COMPANIES.**

16 A.   The group, which I refer to as the comparison or water group, were selected based on the

17 following criteria: (1) listed as water utility companies and covered by the *Value Line Investment*

18 *Survey Expanded Edition* and *C.A. Turner Utility Reports*, (2) water revenues of at least 80% of

19 total revenues, (3) earnings per share forecasts available from at least one of three sources – Zacks,

20 First Call, and/or Multex Investor. These screens produced a group of five companies - American

1   States Water Company, California Water Service Co., Connecticut Water Service Co., Middlesex

2   Water, and Philadelphia Suburban Corp.

3   Summary financial statistics for the comparison group are provided on page 1 of Schedule

4   JRW-2. On average, the water group has mean net plant of $607.6 million and mean total revenues

5   of $182.8 million. The group has an average common equity ratio of 43%, and a current earned

6   return on common equity of 11.0%. PAWC is larger than the group, with a slightly lower interest

7   coverage ratio (3.1), common equity ratio (41.4%) and return on common equity (9.8%).

8   Nonetheless, PAWC and the comparison group of water companies are quite similar overall and

9   therefore the equity cost rate results for the group should provide a good measure for PAWC.

10

11   **III. CAPITAL STRUCTURE RATIOS AND DEBT COST RATES**

12

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

14   **AND SENIOR CAPITAL COST RATES?**

15   A.   PAWC has proposed the following capital structure ratios in Schedule 1 of PAWC Exhibit

16   No. 9-A: 42.20% common equity, 0.98% preferred stock, and 56.82% long-term debt. The

17   company has also proposed cost rates for preferred stock of 8.08% and long-term debt of 6.15%.

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

19   **ARE YOU USING TO ESTIMATE AN OVERALL RATE OF RETURN FOR PAWC?**

20   A.   In response to Interrogatory OCA-R-8, Set IV, Mr. Moul has provided the quarterly

1 capitalization ratios, including and excluding short-term debt, for the past three years. These data

2 are summarized on page 2 of Schedule JRW-1. There are two issues with respect to PAWC's

3 proposed capitalization. First, it is clear that PAWC has consistently used short-term debt as a

4 source of capital. Second, Mr. Moul has made the claim that PAWC will have no short-term

5 debt outstanding as of the end of the test year. In PAWC's last rate case (Docket No. R-

6 000016339), Mr. Moul proposed a capital structure with no short-term debt as of the end of the

7 test year, December 31, 2001. However, as shown on page 2 of Schedule JRW-1, PAWC had

8 over $15M outstanding at the end of the test year. In fact, PAWC has consistently used short-

9 term debt as a source of capital and has had short-term debt outstanding at the end of each and

10 every quarter over the past three years.

11   To reflect PAWC's actual capitalization, I am using the Company's proposed preferred

12 stock and common equity ratios -- 0.98% for preferred stock, 42.20% for common equity. But, I

13 propose breaking the Company's proposed long-term debt ratio of 56.82% into a short-term and a

14 long-term component. These components are based on the three-year quarterly short-term and

15 long-term average debt ratios (as a percent of total debt) and are developed on page 2 of Schedule

16 JRW-1. I will also use the Company's most recent short-term debt cost rate, which was provided in

17 response to Interrogatory OCA-R-8, Set IV. My proposed capital structure ratios and senior

18 capital cost rates are shown below.

19

20

Capital	Ratio	Cost Rate
Short-Term Debt	4.67%	1.42%
Long-Term Debt	52.15%	6.15%
Preferred Stock	0.98%	8.08%
Common Equity	42.20%	

1

2 **IV. THE COST OF COMMON EQUITY CAPITAL**

3 **A. OVERVIEW**

4

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

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

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

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

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

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

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

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

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

14 adequate return on capital to attract investors.

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

1 **CONTEXT OF THE THEORY OF THE FIRM.**

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

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

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

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

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

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

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

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

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

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

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

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

14 firm's securities must be equal.

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

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

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

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

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

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

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

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

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

4   and the market-to-book ratio in the following manner:[1]

5   Fundamentally, the value of a company is determined by the cash flow it
6   generates over time for its owners, and the minimum acceptable rate of return
7   required by capital investors. This "cost of equity capital" is used to discount the
8   expected equity cash flow, converting it to a present value. The cash flow is, in turn,
9   produced by the interaction of a company's return on equity and the annual rate of
10   equity growth. High return on equity (ROE) companies in low-growth markets, such
11   as Kellogg, are prodigious generators of cash flow, while low ROE companies in
12   high-growth markets, such as Texas Instruments, barely generate enough cash flow
13   to finance growth.
14

15   A company's ROE over time, relative to its cost of equity, also determines
16   whether it is worth more or less than its book value. If its ROE is consistently
17   greater than the cost of equity capital (the investor's minimum acceptable return), the
18   business is economically profitable and its market value will exceed book value. If,
19   however, the business earns an ROE consistently less than its cost of equity, it is
20   economically unprofitable and its market value will be less than book value.
21

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

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

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

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

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

27   **CAPITAL FOR PUBLIC UTILITIES?**

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

1 A.   Schedule JRW-6 provides indicators of public utility equity cost rates for recent years.

2 Page 1 shows the dividend yields for the fifteen utilities in the Dow Jones Utilities Average over

3 the past decade. These yields peaked in 1994 at 6.7%. Since that time they have declined and have

4 remained in the 4.5-5.0 percent range in recent years.

5   Average earned returns on common equity and market-to-book ratios are given on page 2 of

6 Schedule JRW-6. Over the past decade, earned returns on common equity have consistently been

7 in the 10.0 - 13.0 percent range. The low point was 10.3 % in 1997 and they have increased to 13

8 percent range as of the year 2002. Over the past decade market-to-book ratios for this group

9 bottomed out at 138% in 1995 and they have increased to the 160-180 percent range in recent years.

10   The indicators in Schedule JRW-6, coupled with the overall decrease in interest rates,

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

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

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

14 the overall equity cost rate.

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

16 **RATE OF RETURN ON EQUITY?**

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

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

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

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

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

3 Firm risk is often separated into business and financial risk. Business risk encompasses all factors

4 that affect a firm's operating revenues and expenses. Financial risk results from incurring fixed

5 obligations in the form of debt in financing its assets.

6 **Q.   COMPARE THE BUSINESS AND FINANCIAL RISK OF PUBLIC UTILITIES**

7 **AND OTHER INDUSTRIES.**

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

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

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

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

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

13 JRW-7 provides an assessment of investment risk for 100 industries as measured by beta, which

14 according to modern capital market theory is the only relevant measure of investment risk that need

15 be of concern for investors. These betas come from the *Value Line Investment Survey* and are

16 compiled by Aswath Damodoran of New York University. They may be found on the Internet at

17 http://www.stern.nyu.edu/~adamodar/. The study shows that the investment risk of public utilities

18 is quite low. The electric, gas distribution, and water utility industries are all ranked in the bottom

19 10% of the 100 industries. As such, the cost of equity for these industries is among the lowest of all

20 industries in the U.S.

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

2 **EQUITY CAPITAL BE DETERMINED?**

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

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

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

6 judgment. This return to the equity owner should be commensurate with returns on investments in

7 other enterprises having comparable risks. In my experience, the Pennsylvania Public Utility

8 Commission has relied primarily on the DCF method to determine the appropriate rate of return on

9 common equity. This is consistent with the approach I have taken here.

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

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

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

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

14 discount expected cash flows associated with common stock ownership.

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

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

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

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

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

20 conditions in the economy and the financial markets.

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

2 **THE COMPANY?**

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

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

5 have also performed a risk premium (RP) study, but I give these results less weight because I

6 believe that risk premium studies provide a less reliable indication of equity cost rates for public

7 utilities.

8

9 **B. DISCOUNTED CASH FLOW ANALYSIS**

10

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

12 **MODEL.**

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

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

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

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

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

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

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

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

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

2   can be expressed as:

3
4
5   $$P = \frac{D_1}{(1+k)^1} + \frac{D_2}{(1+k)^2} + \dots \frac{Dn}{(1+k)^n}$$
6
7
8   where P is the current stock price, D_n is the dividend in year n, and k is the cost of common equity.

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

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

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

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

13 following:

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

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

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

21 constant-growth DCF model to estimate a firm's cost of equity, you solve for k in the above

22 expression and obtain the following:

23
24
25 $$k = \frac{D_1}{P} + g$$
26
27

1   In the constant-growth version of the DCF model, the current dividend payment and stock price are

2   directly observable. Therefore, the primary problem and controversy in applying the DCF model to

3   estimate equity cost rates entails estimating investors' expected dividend growth rate.

4   **Q.   WHAT FACTORS SHOULD ONE CONSIDER WHEN APPLYING THE DCF**

5   **METHODOLOGY?**

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

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

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

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

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

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

12 to investors, to accurately estimate investors' expectations.

13 **Q.   IS THE CONSTANT GROWTH DCF MODEL CONSISTENT WITH**

14 **VALUATION TECHNIQUES EMPLOYED BY INVESTMENT FIRMS?**

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

16 technique. Schedule JRW-8 provides a description of a three-stage DCF or dividend discount

17 model (DDM), which is commonly referred to as the Merrill Lynch DDM.[2] This model presumes

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

---

[2] A description of this model is found in William F. Sharp, Gordon J. Alexander, and Jeffrey V. Bailey, *Investments* (Prentice-Hall, 2000), pp. 348-9.

1   through a transition stage, and finally assumes a steady state stage. The dividend payment stage of

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

3   the life cycle of the product or service. Given the regulated status of public utilities, and especially

4   the fact that their returns on investment are effectively set through the ratemaking process, the

5   industry would be in the steady-state stage of a three-stage DDM. The DCF valuation procedure

6   for companies in this stage is the constant-growth DCF.

7   **Q.   WHAT DIVIDEND YIELD DO YOU EMPLOY IN YOUR DCF ANALYSIS FOR**

8   **THE WATER GROUP?**

9   A.   The dividend yields on the common stock for the comparison group are provided in

10   Schedule JRW-3 for the seven-month period ending July, 2003. Over this period, the average

11   monthly dividend yield for this group has been in the 3.5% range. However, of particular note, is

12   the decline in recent months in the dividend yields. This decline has been attributed to the new

13   tax law that was signed on May 28th. To reflect the impact on the new tax law, I will use the

14   average dividend yield for the group for the last two months. This figure is 3.3%.

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

16   **DIVIDEND YIELD.**

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

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

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

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

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

2   on a quarterly basis.[3]

3   In applying the DCF model, it is common to adjust the current dividend for growth over the

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

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

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

7   quite different. Consequently, it is common to adjust the dividend yield by some fraction of the

8   long-term expected growth rate.

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

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

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

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

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

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

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

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

17 **FOR YOUR DIVIDEND YIELD?**

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

19 reflect growth over the coming year.

---

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

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

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

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

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

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

6 assess long-term potential. Alternative approaches to measure these expectations tend to generate

7 different results, and therein lies the debate.

8 **Q.   HOW ARE YOU DETERMINING A GROWTH RATE COMPONENT FOR YOUR**

9 **DCF MODEL?**

10 A.   I have analyzed many measures of growth for the companies in the water company group.

11 Initially, I evaluated historic earnings, dividends, and book value per share growth rates as provided

12 in the *Value Line Investment Survey*. I have also used *Value Line's* 5-year projected growth rate

13 estimates for earnings, dividends, and book value per share. In addition, I have utilized earnings

14 growth rate forecasts as provided by Zacks, Multex Global, and First Call. These services solicit 5-

15 year earning growth rate projections for securities analysts and compile and publish the averages of

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

17 assessed prospective growth as measured by prospective earnings retention rates and returns on

18 average common equity.

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

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

1 **WELL AS INTERNAL GROWTH.**

2 A.　　Historic growth rates for earnings, dividends, and book value per share are readily available

3 to virtually all investors and presumably an important ingredient in forming expectations

4 concerning future growth.　However, one must use historic growth numbers as measures of

5 investors' expectations with caution.　In some cases, past growth may not reflect future growth

6 potential.　Also, employing a single growth rate number (for example, for five or ten years), is

7 unlikely to accurately measure investors' expectations due to the sensitivity of a single growth rate

8 figure to fluctuations in individual firm performance as well as overall economic fluctuations (i.e.,

9 business cycles).　However, one must appraise the context in which the growth rate is being

10 employed.　According to the conventional DCF model, the expected return on a security is equal to

11 the sum of the dividend yield and the expected long-term (actually **infinite**) growth in dividends.

12 Therefore, to best estimate the cost of common equity capital using the conventional DCF model,

13 one must look to long-term growth rate expectations.

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

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

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

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

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

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

20 Q.　　WHAT GROWTH DATA HAVE YOU REVIEWED FOR GROUP OF WATER

1   **COMPANIES?**

2   A.   Schedule JRW-4 provides the following growth rates for the companies in the group:

3   historic five- and ten-year historic growth rates in earnings, dividends, and book value per share

4   (where available) as computed by *Value Line* (using the *Value Line* methodology); and projected

5   five-year EPS growth rates from Zacks, Multex Global, and First Call as well as *Value Line's*

6   projected 5-year growth rates for earnings, dividends, and book value per share.

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

8   **GROWTH RATES FOR THE GROUP OF WATER COMPANIES.**

9   A.   Page 1 of Schedule JRW-4 provides a summary of historic growth rates for the companies

10   in the group as provided in the *Value Line Investment Survey.* Historic growth in earnings,

11   dividends, and book value for the group range from 2.3% to 4.3%, and the average of the historic

12   five- and ten-year earnings, dividends, and book value growth is 3.1%.

13   **Q.   WHAT PROSPECTIVE AND FORECASTED GROWTH RATES ARE**

14   **INDICATED BY *VALUE LINE* FOR THE WATER GROUP.**

15   A.   Prospective internal growth is 4.2%, with *Value Line's* average projected retention and

16   equity return rates of 35.8% and 11.2%, respectively. *Value Line's* average projected growth rates

17   for earnings, dividends, and book value per share for the group are 8.3%, 2.8%, and 6.2%,

18   respectively. However, these projections are for only three of the five companies, as there are no

19   projections for Connecticut Water Service and Middlesex Water.

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

1   **FORECASTS OF EXPECTED 5-YEAR GROWTH IN EARNINGS PER SHARE (EPS).**

2   A.   Zacks, First Call, and Multex Global collect, summarize, and publish Wall Street analysts'

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

4   comparison group companies on page 2 of Schedule JRW-4. Since (1) there is considerable

5   overlap in analyst coverage between the three services, and (2) not all of the companies have

6   forecasts from the different services, I have averaged the expected 5-year EPS growth rates from

7   the three services for each company to arrive at an expected EPS growth rate by company. The

8   right-hand column shows these averages, and the mean for the group is 5.1%.

Table 1
Comparison Group of Water Companies
Growth Rate Indicators

Historic Growth	
5-Year Historic EPS Growth	2.3%
5-Year Historic DPS Growth	2.4%
5-Year Historic BVPS Growth	4.3%
10-Year Historic EPS Growth	2.3%
10-Year Historic DPS Growth	2.4%
10-Year Historic BVPS Growth	4.3%
Average	3.1%

Projected Growth	
Prospective Internal Growth	4.2%
Average Projected DPS Growth (3 Cos)	2.8%
Average Projected BVPS Growth (3 Cos)	6.2%
Average Projected EPS Growth (3 Cos)	8.3%
Average	5.4%

Average Projected EPS Growth	
American States Water Co.	3.3%
California Water	3.3%
Connecticut Water	3.0%
Middlesex Water	7.0%
Philadelphia Suburban	9.1%
Average Projected EPS Growth	5.1%

Q.   PLEASE SUMMARIZE YOUR ANALYSIS OF THE HISTORIC AND PROSPECTIVE GROWTH OF THE WATER COMPANY GROUP.

A.   Table 1 above provides a summary of historic and prospective growth rates for the group. Historic indicators imply an average growth rate for the comparison group of 3.1%. Projected growth for the group is higher and has a broader range. The average of *Value Lines'* projected growth rate figures is 5.4%. And the average projected EPS growth rate (as indicated by Zacks, First Call, and Multex Global) is 5.1%. Given these results and the discussion above, and giving

1 more weight to the prospective and projected figures, expected average growth would appear to

2 be in 5.0 percent range. I will use this figure - 5.0% - as the expected growth component of my

3 DCF model.

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

5 **EQUITY COST RATE FROM THE DCF MODEL FOR COMPARISON GROUP?**

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

$$\text{DCF Equity Cost Rate } (k) \quad = \quad \frac{D_1}{P} \quad + \quad g$$

12   Water Group $3.3\% * 1.025 + 5.00\% = 8.4\%$

16   **C. RISK PREMIUM APPROACH**

18 **Q.   HOW WILL YOU ESTIMATE THE COMPANY'S EQUITY COST RATE USING**

19 **THE RISK PREMIUM APPROACH?**

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

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

$$k \quad = \quad R_f \quad + \quad RP$$

1   I use the yield on long-term Treasury securities as the risk-free interest rate, and estimate the risk

2   premium by assessing investors' return requirements and market-to-book ratios for water service

3   companies.

4   **Q.   PLEASE PROVIDE AN OVERVIEW OF YOUR RISK PREMIUM APPROACH.**

5   A.   The risk premium approach that I use is based on two fundamental economic concepts: the

6   economic theory of the firm, as discussed earlier in my testimony, and the fundamental financial

7   proposition of a positive relationship between risk and return. According to economic theory, when

8   a firm's accounting profits (which include capital costs) are sufficient to meet investors'

9   requirements, the market value and the book value of the firm will be equal. Accordingly, if a firm

10 is earning profits greater than required by investors, the market-to-book ratio will be greater than

11 1.0, and if a firm is earning profits less than required by investors, the market-to-book ratio will be

12 less than 1.0. In recent years, the market-to-book ratios for water service companies have been

13 greater than 1.0, indicating that the earnings of these companies are more than sufficient to meet

14 investors' requirements. The positive relationship between risk and return requires that, in a world

15 of risk aversion, investors require a higher expected return for a higher level of perceived risk in an

16 investment. By definition, the premium for assuming risk is based on the difference between the

17 expected return on the risky investment and the expected return on a riskless investment.

18 **Q.   HOW DO YOU PERFORM YOUR RISK PREMIUM STUDY?**

19 A.   As discussed above, a market-to-book ratio of 1.0 indicates that investors' return

20 requirements are being met. In my approach, the risk premium, defined as the return on common

1   equity minus the riskless interest rate, is compared to contemporaneous market-to-book ratios. As

2   such, this methodology shows the additional return that utility common stock investors require

3   above the risk-free interest rate.

4   To establish a cost of equity for the Company, I examine required rates of return as

5   indicated by both accounting- and market- based rates of return. I perform the study in three steps

6   for the companies in the water group: (1) using the companies in the group, I compute the premium

7   for risk required by investors as the expected return on equity minus the yield on long-term

8   Treasury securities; (2) I regress the risk premium for each firm on the market-to-book ratio for

9   different time periods; and (3) I add the indicated average risk premium for the water service

10 companies to the current yield on long-term Treasury securities.

11 **Q.   PLEASE DISCUSS THE FEATURES OF YOUR RISK PREMIUM STUDY.**

12 A.   First, by directly comparing the expected returns on equity (minus the risk-free interest rate)

13 to market-to-book ratios, I am directly measuring the accounting earnings required by investors.

14 Risk premium studies that measure a risk premium as the difference between bond and stock

15 returns do not directly address the adequacy of accounting earnings. Second, I am using historic

16 and forecasted returns on equity and not simply historic bond and stock returns to determine

17 investor return requirements and an appropriate risk premium. Security prices and capital cost rates

18 are based on expectations of the future and not on extrapolations of returns from the past. Third, I

19 am employing a group of water service companies (and not a broader group of companies or

20 utilities) to measure investors' return requirements. Fourth, I am using the same base in my risk

1   premium study - the yield on long-term Treasury securities - as I use in estimating the cost of equity

2   for the Company employing the risk premium approach. I do not establish a risk premium utilizing

3   bond returns as a base and then estimate an equity cost rate utilizing current bond yields as a base

4   rate. And finally, since my risk premium study does not evaluate returns derived from a series of

5   security prices over long time periods, the appropriate measure of central tendency for historic

6   returns - arithmetic mean or median, or geometric mean returns - is not an issue.

7   **Q.   WHAT RISK-FREE RATE OF INTEREST ARE YOU USING IN YOUR**

8   **ANALYSIS?**

9   A.   The riskless or risk-free rate of interest is presumed to be equal to the yields on obligations

10 of the U.S. Treasury. These obligations are termed riskless because they are presumed to have no

11 default risk.

12   Page 2 of Schedule JRW-5 shows the yields on 10-year Treasury securities over the past 18

13 months. These yields have declined from the five percent range to 3.33 percent as of June, 2003.

14 Since that time, the 10-year Treasury yield has increased to 4.0%. Considering the range over the

15 past six months, I will utilize 4.0% as the risk-free rate in my risk premium approach.

16 **Q.   PLEASE PROVIDE THE DETAILS OF YOUR RISK PREMIUM STUDY.**

17 A.   As described above, I examine required rates of return as indicated by both accounting- and

18 market- based rates of return. My risk premium study uses past and expected returns since capital

19 cost rates and security prices are based on expectations of the future. I perform a risk premium

20 study for the companies in the water group. Forecasts of returns on common equity (ROE) are

1   available from the *Value Line Investment Survey* for these companies. I use a one-year base period

2   (2002/2003) in my risk premium study. *Value Line* publishes individual company updates four

3   times per year. For each *Value Line* update, I obtain the year t-1, t, t+1 and the 3-5 year projected

4   ROE. If a return on equity is unavailable from *Value Line*, I employ the currently reported return on

5   equity from *C. A. Turner Utility Reports,* which is the source of the market-to-book ratios. The

6   yield on long-term Treasury securities for the appropriate month comes from the Federal Reserve

7   Website (www.federalreserve.gov). For each company, I compute the risk premium as the ROE

8   minus the yield on long-term Treasury securities. I average the ROEs for the different time periods

9   to determine the expected ROE. I then regress the risk premium (using the average ROE and the

10 risk-free rate) on the market-to-book ratio for the firms in the water group. Finally, I add the

11 indicated average risk premium to the current yield on long-term Treasury securities to obtain an

12 equity cost rate for the Company.

13 **Q.   PLEASE DISCUSS THE RESULTS OF YOUR RISK PREMIUM ANALYSIS.**

14 A.   The table on page 1 of Schedule JRW-5 shows the regression results for the four different

15 time periods. The results suggest that risk premium has ranged from about 1.96% to 4.10% over

16 the past year. The average is 2.69%, which I will use as my equity risk premium.

17 **Q.   WHAT EQUITY COST RATE DO YOU ESTIMATE FOR THE COMPANY**

18 **USING THE RISK PREMIUM APPROACH?**

19 A.   Given my risk-free rate and risk premium, the indicated equity cost rate for the group using

20 the risk premium approach is:

1	Risk Premium Equity Cost Rate	=	Riskfree Rate	+	Risk Premium		
2	Water Group		4.0%	+	2.69%	=	6.7%

3

D. EQUITY COST RATE SUMMARY

5

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

7 A. My DCF analysis for the comparable group indicates an equity cost rate of 8.4%. My risk

8 premium analysis suggests an equity cost rate of 6.7%.

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

10 **ARE YOU MAKING FOR PAWC?**

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

12 recommending the DCF equity cost rate of 8.4% for PAWC.

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

14 A. Yes it is. My recommended rate of return is low by historic standards for three reasons.

15 First, as discussed above, capital costs are very low by historic standards. The yield on ten-year

16 Treasuries was at a 45-year low last month. Second, the new tax law, which reduces the tax rates

17 on dividend income and capital gains, lowers the pre-tax return required by investors. And third, as

18 discussed below, the equity or market risk premium has declined.

19 **Q. HOW DO YOU TEST THE REASONABLENESS OF YOUR 8.4%**

20 **RECOMMENDATION?**

1 A.   To test the reasonableness of my 8.4% recommendation, I have examined the relationship

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

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

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

5 **8.4% RECOMMENDATION?**

6 A.   Schedules JRW-2 and JRW-4 provide financial performance and market valuation statistics

7 for the group. The average current return on equity and market-to-book ratio for the group are

8 11.0% and 2.55, respectively. These results indicate that these companies are earning returns on

9 equity **significantly above** their equity cost rates. As such, this observation provides evidence that

10 my recommended equity cost rate of 8.4% is reasonable and fully consistent with the financial

11 performance and market valuation of the water group.

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

13 **RECENT YIELDS ON PUBLIC UTILITY BONDS.**

14 A.   In recent months the yields on public utility bonds have been in the 6.5-7.0 percent range.

15 My equity return recommendation of 8.4% must be viewed in the context of the significant shift in

16 the risk and return characteristics of bonds and stocks over the past two decades. This change and

17 its implications for equity risk premiums are discussed further in my critique of Mr. Moul's

18 testimony. In short, the relative risk of stocks and bonds has changed in recent years as stocks have

19 become less volatile and risky while bonds have become more volatile and risky. This change is

20 readily evidenced by the high level of real interest rates (nominal yields minus inflation) in the

1   economy. Today, with 10-year Treasuries yielding about 4.0% and inflation of about 1.5%, the real

2   rate of interest is approximately 3.0%. Historically, this figure has averaged 2.0%. The fact that

3   stocks and bonds are nearly equal in terms of volatility and risk implies that investors' required rates

4   of returns on stocks and bonds are much closer today than in the past. Accordingly, the return

5   premium that equity investors require over bond yields is much lower than it was when stock

6   returns were much more volatile than bond returns.

7   **Q.   WHAT IS THE MAGNITUDE OF THE DECLINE OF THE EQUITY RISK**

8   **PREMIUMS?**

9   A.   Most historic assessments of the equity risk premium (such as the analysis performed by

10 Mr. Moul) suggest an equity risk premium of 5-7 percent above the rate on long-term Treasury

11 bonds. However, recent studies by leading academic scholars and investment firms suggest that

12 this equity risk premium is now in the 2-4 percent range.

13 **Q.   PLEASE BRIEFLY SUMMARIZE THE NEW ACADEMIC STUDIES ON THE**

14 **DECLINE IN THE EQUITY RISK PREMIUM.**

15 A.   Several recent studies suggest that the historic equity risk premium is severely biased as a

16 measure of the expected risk premium. Jeremy Siegel, a Wharton finance professor and author of

17 the popular book *Stocks for the Long Term*, recently published a study entitled "The Shrinking

18 Equity Risk Premium."[4] His concluding observations include the following:

19   "The degree of the equity risk premium calculated from data estimated from 1926 is
20   unlikely to persist in the future. The real return on fixed-income assets is likely to be

---

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

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1	significantly higher than estimated on earlier data. This is confirmed by the yields available
2	on Treasury index-linked securities, which currently exceed 4%. Furthermore, despite the
3	acceleration in earnings growth, the return on equities is likely to fall from its historical
4	level due to the very high level of equity prices relative to fundamentals."
5	

6   The declining equity risk premium, as well as the controversy of alternative approaches for

7   estimating the cost of equity capital, has been the subject of several very recent studies. The

8   primary debate revolves around two related issues: (1) the size of equity risk premium which is the

9   return equity investors require above the yield on bonds; and (2) the fact that estimates of the equity

10   risk premium using fundamental firm data (earnings and dividends) are much lower than estimates

11   using historic stock and bond return data. Eugene Fama and Ken French, two of the most

12   preeminent scholars in finance, recently published a paper entitled "The Equity Premium."[5] They

13   use dividend and earnings growth models to estimate expected stock returns and equity risk

14   premiums and compare these results to actual stock returns. For the period 1951-2000, they

15   estimate that the expected equity risk premium from DCF models using dividend and earnings

16   growth to be between 2.55% and 4.32%. These figures are much lower than the equity risk

17   premium produced from the average stock and bond return returns between 1926 and 2002, which

18   is 8.4.

19   They conclude that the estimates using DCF models and fundamental data are superior to

20   those using historic stock returns for three reasons: (1) the estimates are more precise (a lower

21   standard error); (2) The Sharpe ratio, which is measured as the [(expected stock return – risk-free

[5]Eugene F. Fama and Kenneth R. French, "The Equity Premium," CRSP Working Paper # 522. This paper may be

1   rate)/standard deviation], is constant over time for the DCF models but more than doubles for the

2   average stock-bond return model; and (3) valuation theory specifies relations between the market-

3   to-book ratio, return on investment, and cost of equity capital that favor estimates from

4   fundamentals.   They also conclude that the high average stock returns over the past 50 years were

5   the result of low expected returns and that the average equity risk premium has been in the 3-4

6   percent range.

7   A soon-to-be published study by James Claus and Jacob Thomas of Columbia University

8   provides direct support for the findings of Fama and French.[6] These authors compute equity risk

9   premiums over the 1985-1998 period by (1) computing the discount rate that equates market values

10 with the present value of expected future cash flows, and (2) then subtracting the risk-free interest

11 rate. The expected cash flows are developed using analysts' earnings forecasts. They conclude that

12 over this period the equity risk premium is in the range of 3.0%. They note that over this period

13 average stock returns overstate the equity risk premium because as the equity risk premium has

14 declined, stock prices have risen (present values increase when required rates of return decline).

15 The higher stock prices have produced returns that have exceeded expectations and therefore

16 historic equity risk premium estimates are biased upwards.

17 **Q.   DOES THE INVESTMENT COMMUNITY ALSO RECOGNIZE THAT THE**

18 **EQUITY RISK PREMIUM HAS DECLINED?**

---

downloaded from the Internet at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=236590.
[6] 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," Forthcoming, *Journal of Finance*.

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

2   leading investment strategists.[7] His study showed that the market or equity risk premium had

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

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

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

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

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

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

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

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

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

12   range above the interest rate on U.S. Treasury bonds.[8]

13   **Q.   IS THIS DECLINE IN THE EQUITY RISK PREMIUM A GENERALLY**

14   **ACCEPTED NOTION BY GOVERNMENT POLICY MAKERS?**

15   A.   Yes. In fact, Alan Greenspan, the Chairman of the Federal Reserve Board, indicated in an

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

17   during the past decade is "not in dispute." He summarized some of the elements of the decline in

---

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

[8] 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.

1 the following passage:[9]

2 "There can be little doubt that the dramatic improvements in information technology in
3 recent years have altered our approach to risk. Some analysts perceive that information
4 technology has permanently lowered equity premiums and, hence, permanently raised the
5 prices of the collateral that underlies all financial assets.
6
7 The reason, of course, is that information is critical to the evaluation of risk. The less that
8 is known about the current state of a market or a venture, the less the ability to project
9 future outcomes and, hence, the more those potential outcomes will be discounted.
10
11 The rise in the availability of real-time information has reduced the uncertainties and
12 thereby lowered the variances that we employ to guide portfolio decisions. At least part of
13 the observed fall in equity premiums in our economy and others over the past five years
14 does not appear to be the result of ephemeral changes in perceptions. It is presumably the
15 result of a permanent technology-driven increase in information availability, which by
16 definition reduces uncertainty and therefore risk premiums. This decline is most evident
17 in equity risk premiums. It is less clear in the corporate bond market, where relative
18 supplies of corporate and Treasury bonds and other factors we cannot easily identify have
19 outweighed the effects of more readily available information about borrowers.
20
21 The marked increase over this decade in the projected slope of technology advance, of
22 course, has also augmented expectations of earnings growth, as evidenced by the dramatic
23 increase since 1995 in security analysts' projections of long-term earnings. While it may
24 be that the expectations of higher earnings embodied in equity values have had a spillover
25 effect on discount factors, the latter remain essentially independent of the earnings
26 expectations themselves.
27
28 That equity premiums have generally declined during the past decade is not in dispute.
29 What is at issue is how much of the decline reflects new, irreversible technologies, and
30 what part is a consequence of a prolonged business expansion without a significant period
31 of adjustment. The business expansion is, of course, reversible, whereas the technological
32 advancements presumably are not."
33

34 **Q.   PLEASE SUMMARIZE YOUR 8.4% EQUITY RETURN RECOMMENDATION**

35 **IN LIGHT OF THIS DISCUSSION OF CAPITAL COSTS.**

---

[9] Alan Greenspan, "Measuring Financial Risk in the Twenty-First Century," OCC Conference, October 14, 1999.

1 A.   As I noted, my recommended rate of return is low by historic standards due to the lows

2 level of interest rates today, the new tax law, and the decline in the equity or market risk premium.

3 While the impact of the first two factors are rather apparent, the lower equity risk premium is not.

4 However, I have cited the research and observations of leading academics, investment firms, and

5 government policy makers on the topic and there clearly is a consensus that the equity risk

6 premium has declined over time.

7

8   **V. CRITIQUE OF PAWC'S RATE OF RETURN TESTIMONY**

9

10 Q.   **PLEASE SUMMARIZE MR. MOUL'S OVERALL RATE OF RETURN**

11 **RECOMMENDATION.**

12 A.   As summarized below, Mr. Moul's overall rate of return recommendation is 8.53%.

Capital Source	Ratio	Cost Rate	Weighted Cost Rate
L-T Debt	56.82%	6.15%	3.49%
Preferred Stock	0.98%	8.08%	0.08%
Common Equity	42.20%	11.75%	4.96%
Cost of Capital			8.53%

20 Whereas I have adopted Mr. Moul's long-term debt cost rate, I believe that his capital structure,

21 equity cost rate estimate, and overall rate of return recommendation are inappropriate. In this

22 testimony, I address these differences in our assessments of the appropriate return for PAWC. I

23 also critique Mr. Moul's adjustment to account for the divergence of market and book values, and

24 interest coverage as a test of reasonableness.

1 Q. **INITIALLY, PLEASE INDICATE WHETHER MR. MOUL HAS**

2 **INCORPORATED THE NEW TAX LEGISLATION INTO HIS RECOMMENDATION.**

3 A. In Interrogatory OCA-R-1, Set XI, Mr. Moul was asked how the new tax law affects his

4 cost of equity estimates using his four different equity cost rate methods. His response suggests that

5 the new law does not impact his cost of equity approaches and estimates. However, this response

6 is in error. All of his approaches evaluate pre-tax returns. Investors clearly focus on after-tax

7 returns. In Schedule JRW-12, I have provided a copy of a recent *Wall Street Journal* that highlights

8 the impact of the new law on dividend-paying stocks like those of utilities. As such, Mr. Moul's

9 equity cost rate results, which focus on pre-tax returns, need to be adjusted downwards to reflect the

10 after-tax returns and the new tax law.

11 Q. **PLEASE REVIEW YOUR OBJECTION TO MR. MOUL'S CAPITAL**

12 **STRUCTURE FOR PAWC.**

13 A. As noted above, PAWC has consistently used short-term debt as a source of capital and

14 therefore it should be included in the Company's capital structure. Page 2 of Schedule JRW-1

15 provides PAWC'S quarterly capitalization ratios, including short-term debt, for the past three

16 years. On average on a quarterly basis, 4.85% of PAWC's capital has been in the form of short-

17 term debt. PAWC has had short-term debt outstanding each and every quarter over the past three

18 years. This observation is not consistent with the Company's claim in this rate case (and in

19 previous rate cases) that short-term debt only represents temporary interim financing which is

20 refinanced periodically with permanent capital.

1   In sum, given PAWC's consistent use of short-term debt as a source of capital, Mr. Moul

2   has erred in not including it in his proposed capital structure for the Company.

3   **Q.   BEFORE DISCUSSING THE MR. MOUL'S EQUITY COST RATE ESTIMATE,**

4   **PLEASE ADDRESS THE BUSINESS RISK OF PAWC.**

5   A.   Standard & Poor's rates the business risk of utilities on a 1 to 10 scale, with 1 being the

6   lowest business risk and 10 the highest. PAWC was rated a 3 on this scale, which indicates a

7   very low business risk level and which is similar to that of his group of three water companies.

8   Furthermore, Pennsylvania allows for timely recovery of capital expenditures oriented toward

9   infrastructure system improvements through the Distribution System Improvement Charge

10   (DSIC). This reduces the business risk for Pennsylvania water companies. As provided in the

11   Company's response to Interrogatory OCA-R-3, Set IV, almost 40 percent of PAWC's capital

12   expenditures over the next five years can be recovered through the DSIC. As such, the S&P

13   business risk ratings and the DSIC indicate that PAWC has very little business risk.

14   **Q.   PLEASE REVIEW MR. MOUL'S EQUITY COST RATE APPROACHES.**

15   A.   Mr. Moul estimates an equity cost rate for PAWC by applying four equity cost rate models

16   to a group of water service companies and a group of Local Gas Distribution Companies

17   ("LDCs"). His water group includes only three companies: American States Water Company,

18   California Water Service Group, and Philadelphia Suburban. The LDC group includes ten LDCs.

19   His equity cost rate approaches include a DCF model, a comparable earnings analysis, a historic

20   risk premium, and the CAPM. His equity cost rate estimates are summarized below:

1 <u>Summary of Approaches and Results</u>
2

	Water Group	LDC Group	Average
DCF	10.53%	12.09%	11.31%
Risk Premium	11.75%	12.00%	11.88%
CAPM	15.39%	14.69%	15.04%
Comparable Earnings	14.20%	14.20%	14.20%

3
4 Based on these figures, he arrives at an equity cost rate estimate for PAWC of 11.75%.

5   The primary errors in his equity cost rate studies are (1) excessive and unjustifiable DCF

6 growth rates for his Water and LDC Groups, (2) an arbitrary adjustment to his DCF estimates to

7 reflect the difference between book and market values in the firm's capitalizations; (3) outdated and

8 biased equity risk premium estimates for his risk premium and CAPM analyses, and (4) a flawed

9 comparable earnings analysis. I also believe that he has erred (a) in his choice of companies for his

10 Water Group and (b) by using a group of LDCs to estimate PAWC's equity cost rate. These errors

11 are discussed in detail below.

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

13 **COMPOSITION OF MR. MOUL'S GROUP OF WATER SERVICE COMPANIES.**

14 A.   I have one primary issue with Mr. Moul's Water Group. He has excluded Connecticut

15 Water Company and Middlesex Water, two water companies located in the Northeast that he has

16 used in previous rate of return studies for water companies.

17 **Q.   WHY IS IT INAPPROPRIATE FOR MR. MOUL TO USE A GROUP OF LOCAL**

18 **DISTRIBUTION GAS COMPANIES TO ESTIMATE PAWC'S EQUITY COST RATE?**

19 A.   Mr. Moul has employed a group of ten LDC's to estimate PAWC's equity cost rate. This is

-40-

1 not appropriate. The business risks of the natural gas business are greater than the water business.

2 For example, demand for natural gas is much more weather sensitive, and other fuels compete with

3 natural gas. Furthermore, the group that Mr. Moul has used is especially inappropriate because they

4 are not even pure LDCs. As shown below, the group, on average, only receives 67% of their

5 revenues from gas operations. Hence, using this group is entirely inappropriate.

6 **Mr. Moul's LDC Group**
7 **Percent of Revenues from Gas**

AGL Resources	66%
Atmos Energy	99%
Energen	63%
Keyspan Corp	57%
New Jersey Resources	30%
NICOR	86%
Peoples Energy Corp.	72%
Piedmont Natural Gas Inc.	57%
South Jersey Industries	80%
WGL Holdings	63%
Average	67%
Data: C.A. Turner Utility Reports, July, 2003.	

8

9

10 **Q. PLEASE SUMMARIZE MR. MOUL'S DCF ESTIMATES.**

11 A. Mr. Moul performs a traditional DCF analysis and then adjusts this result upwards to reflect

12 the difference between the market and book value capitalizations of his water group. Mr. Moul

13 uses the following adjusted dividend yields for PSC and the Water and LDC Groups:[10]

---

[10] PAWC Statement No. 9, page 26, ll. 13-14, and Appendix E.

	Water Group	LDC Group
Adjusted Dividend Yield	3.57%	5.01%

1
2 For the growth component of the DCF, he reviews historic and projected growth rate data for the

3 group for earnings per share, dividends per share, book value per share, cash flow per share, and

4 internal growth. Based on these data, he arrives at the following DCF growth rates:[11]

	Water Group	LDC Group
DCF Growth Rate	6.00%	6.25%

5

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

7 using the DCF model. His estimates for the two groups are:[12]

	Water Group	LDC Group
DCF Equity Cost Rate	9.75%	11.26%

8

9 Instead of using these estimates as his DCF equity cost estimate, Mr. Moul makes an adjustment to

10 reflect the difference between the book value capitalization employed in the rate setting process and

11 the groups' market value capitalization. The adjusted DCF estimates for the two groups are:

	Water Group	LDC Group
Adjusted DCF Estimate	10.53%	12.09%

12

13 As such, this adjustment adds an additional 78 and 83 basis points to the DCF equity cost estimates

14 for the Water Group and the LDC Group, respectively.

15 **Q.   PLEASE EXPRESS YOUR CONCERNS WITH MR. MOUL'S DCF STUDY.**

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[11] PAWC Statement No. 9, page 31, ll. 5-7, and Appendix E.

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

2   use of the LDC Group, I have two major concerns with Mr. Moul's DCF equity cost rate study: (1)

3   his excessive and unjustifiable DCF growth rates, and (2) the book value/market value adjustment.

4   **Q.   PLEASE CRITIQUE MR. MOUL'S DCF GROWTH RATE ESTIMATES FOR HIS**

5   **WATER GROUP.**

6   A.   The growth rate estimates for the Water and LDC Groups are out of line with historic as

7   well as analysts' projections of growth. The table below shows *Value Line's* growth rate measures

8   for the Water Group. It shows six measures of historic growth and four measures of projected

9   growth for the companies in the group. The average of the ten growth rate measures for the group

10   is only 4.3% and only two of the ten measures are as large as Mr. Moul's 6.0% growth rate.

11   Clearly, Mr. Moul's DCF growth rate is excessive by these measures.

---

[12]   PAWC Statement No. 9, page 23, ll. 15-20, and Appendix E.

1   **Mr. Moul's Water Group**
2   ***Value Line* Historic and Projected Growth Measures**

Historic Growth

Company	Past 10 Years			Past 5 Years		
	Earnings	Dividends	Book	Earnings	Dividends	Book Value
American States Water Co.	2.0%	1.5%	5.0%	4.5%	1.0%	4.0%
California Water Services	0.0%	2.0%	2.5%	-5.0%	1.5%	1.0%
Philadelphia Suburban	7.5%	4.5%	7.0%	10.0%	6.0%	9.0%
Mean	3.2%	2.7%	3.8%	3.2%	2.8%	4.7%

Projected Growth

Company	Value Line Projected Growth Est'd. '00-'02 to '06-'08			Value Line Internal Growth		
	Earnings	Dividends	Book Value	Return on Equity	Retention Rate	Internal Growth
American States Water Co.	6.0%	2.0%	5.0%	10.5%	47.0%	4.9%
California Water Services	9.0%	1.0%	7.0%	10.0%	39.0%	3.9%
Philadelphia Suburban	10.0%	5.5%	6.5%	15.0%	52.0%	7.8%
Mean	8.3%	2.8%	6.2%	11.8%	46.0%	5.5%

3   Data Sources: Value Line Investment Survey, May 2, 2003.

4   Mr. Moul's DCF growth rate is also excessive as measured by analysts' forecasted EPS

5   growth rates. The table below shows the analysts' forecasts for the group. The average is 5.2%.

6   **Mr. Moul's Water Group**
7   **Analysts' Forecasted EPS Growth Rates**

Company	Yahoo First Call	Multex Global	Zacks	Average
American States Water Co.	3.0%	3.0%	4.0%	3.3%
California Water Services	3.0%	3.0%	4.0%	3.3%
Philadelphia Suburban	10.0%	8.8%	8.4%	9.1%
Mean	5.3%	4.9%	5.5%	5.2%

Data Sources: www.zacks.com, www.marketguide.com,
http://quote.yahoo.com, July 2003.

8

9   Several other specific observations are worth noting concerning Mr. Moul's growth rate

10   estimates for the Water Group:

11   (1) Mr. Moul has ignored historic growth rate figures for the group. This

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1   observation is especially relevant for his group since historic growth rate figures

2   are provided by virtually all financial information sources, given the recent Wall

3   Street research scandals, are an even more important factor in investors'

4   expectations;

5   (2) For the Water Group, of the historic and five-year projected figures employed by

6   Mr. Moul in arriving at his 6.0% growth rate (see PAWC Exhibit No. 9-A,

7   Schedule 10, page 1, and Schedule 11, page 2), only five of seventeen growth

8   rates are as large as 6.0. Clearly, Mr. Moul was very selective in weighing these

9   growth rate figures and gave little or no weight to most of these indicators; and

10   **(3)** The *Value Line* projected dividend growth rates for the Water Group group is

11   only 2.8%. He apparently gave no weight to these growth indicators, which is

12   especially significant *since the relevant growth variable in the DCF model is*

13   *dividends.*

14 **Q.   IS MR. MOUL'S DCF GROWTH RATE FOR THE LDC GROUP SIMILARILY**

15 **UPWARDLY BIASED?**

16 A.   Yes. Mr. Moul's DCF growth rate of 6.25% exceeds historic and projected growth rate

17 measures for the LDC group. For the LDC Group, only three of the seventeen historic and projected

18 figures reviewed by Mr. Moul are as large as his 6.25% DCF growth rate for the group (see PAWC

19 Exhibit No. 9-A, Schedule 10, page 2, and Schedule 11, page 2). Furthermore, the average of the

20 eighteen growth rate measures is only 5.07% and the projected dividend growth rate for the group is

1 only 2.38%. As such, his 6.25% DCF growth rate is well out of line with the historic and projected

2 growth measures for the group.

3 Q. **WHY ARE MR. MOUL'S DCF GROWTH RATES FOR THE WATER AND LDC**

4 **GROUPS EXCESSIVE?**

5 A. Mr. Moul's DCF growth rates are all excessive due to heavy reliance on analysts' five-year

6 forecasts for EPS growth. These growth rate forecasts are collected and published by Zacks, First

7 Call and Multex. These services retrieve and compile EPS forecasts from Wall Street Analysts.

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

9 (Prudential Insurance, Fidelity Investments) investment firms. It is well known that the EPS

10 forecasts of these analysts, especially those on the sell side, are overly optimistic and therefore

11 biased upwards.

12 Q. **PLEASE CRITIQUE MR. MOUL'S DCF GROWTH RATE ESTIMATES.**

13 A. Mr. Moul's DCF growth rates for both groups are excessive and unjustifiable. He has over-

14 weighted several high growth rate estimates for his groups, while ignoring others, especially

15 historic growth. This latter observation is ironic given the research scandal on Wall Street and the

16 fact that major brokerage firms have paid over $1.5B in the Global Research Settlement. In the

17 wake of the controversy over the analysts' research, it seems highly unlikely that investors today

18 would rely exclusively on the forecasts of securities analysts in arriving at expected growth.

19 Clearly, investors have learned to be suspicious of the upwardly biased forecasts of securities

20 analysts. In the academic world, the fact that the EPS forecasts of securities' analysts are biased

1 upwards has been known for years. To demonstrate the magnitude of the bias, I have compared the

2 actual five-year EPS growth for the S&P 500 with the average forecasted EPS growth of Wall

3 Street analysts.

4 **Actual Versus Forecasts EPS Growth for the S&P 500**
5 **1985-2002**

Legend:
—■— S&P 500 5-Year EPS Growth
—▲— Analysts Forecasted S&P 500 5-Year EPS Growth
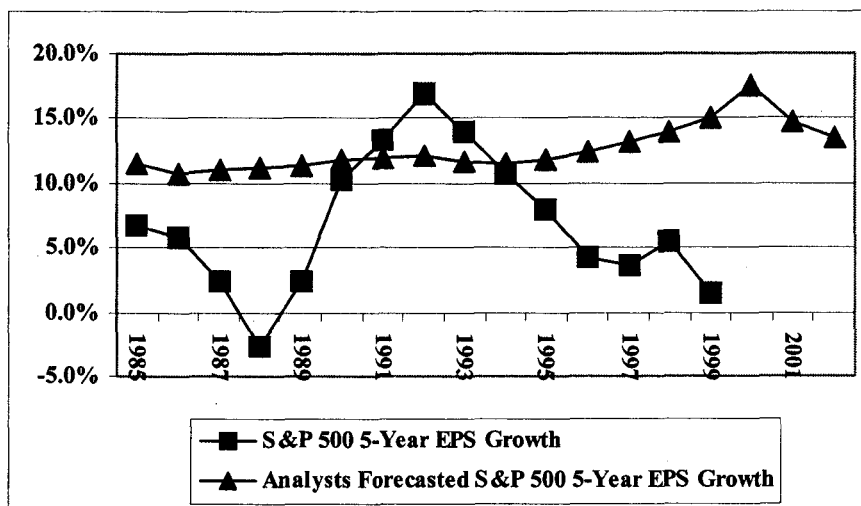
6

7   The results are shown in the figure above and are very dramatic. Whereas Wall Street

8 analysts have continually forecasted 5-year EPS growth for the S&P 500 in the in the 11-16 percent

9 range, these firms have delivered EPS growth in the 7.0 percent range. The only years when firms

10 met analysts' expectations were in the early 1990s. As such, Mr. Moul's over reliance on these

11 upwardly biased forecasts is clearly in error.

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

13 **LED TO MORE HONEST AND LESS BIASED FORECASTED EPS GROWTH RATES?**

14 A.   No. The fact is that analysts continue to provide overly positive outlooks for their stocks. In

15 Schedule JRW-9, I have provided copies of two recent Wall Street Journal articles that focus on

1 this very issue. The first article ("Stock Analysts Still Put Their Clients First") shows that despite

2 the recent reforms, analysts still give higher ratings to companies that employ their firms for

3 investment banking services. In the second article, the title says it all -- "Analysts Still Coming Up

4 Rosy – Over-Optimism on Growth Rates is Rampant – and the Estimates Help to Buoy the

5 Market's Valuation." The following quote also provides insight into the continuing bias in analysts'

6 forecasts:

7 "Hope springs eternal," says Mark Donovan, who manages Boston Partners Large Cap
8 Value Fund. "You would have thought that, given what happened in the last three years,
9 people would have given up the ghost. But in large measure they have not."

10 These overly optimistic growth estimates also show that, even with all the regulatory
11 focus on too-bullish analysts allegedly influenced by their firms' investment-banking
12 relationships, a lot of things haven't changed: Research remains rosy and many believe it
13 always will.

14

15 **Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. MOUL'S DCF GROWTH**

16 **RATE.**

17 A. In short, the DCF growth rates for Mr. Moul's Water and LDC Groups are excessive and

18 unjustifiable. Mr. Moul overweighs several high indicators of projected growth for the Water and

19 LDC Groups and he has ignored historic growth. Even Mr. Moul's own seventeen growth rate

20 indicators for the Water and LDC Groups do not support his DCF growth rates. Furthermore, by

21 relying to such a degree on analysts' forecasts, he is employing a measure that is generally known to

22 be upwardly biased.

23 **Q. PLEASE ADDRESS MR. MOUL'S CRITICISMS OF THE DCF MODEL IN**

1 **GENERAL AND, SPECIFICALLY, THE ADJUSTMENT TO HIS DCF EQUITY COST**

2 **RATE TO ACCOUNT FOR THE CAPITALIZATION CHANGES ASSOCIATED WITH**

3 **THE DIVERGENCE OF MARKET AND BOOK VALUES.**

4 A.   Between pages 22 to 36 of his testimony and in Appendix E, Mr. Moul criticizes the use of

5 the DCF model to estimate equity cost rates in today's market conditions and makes an adjustment

6 for one of these factors. His criticisms can be summarized as follows: (1) there are problems in

7 using the DCF model in this case because the share prices of water utility stocks have risen due to

8 takeover speculation; (2) the assumptions used in the theoretical derivation of the DCF model; (3)

9 in conjunction with the DCF assumptions, which include the assumption of a constant P/E ratio, the

10 fact that P/E ratios are not constant but change over time, and (4) the DCF model produces

11 insufficient earnings when market-to-book ratios are above 1.0. I will address these issues in order.

12   (1) <u>Problems with the DCF model due to rising prices attributed to takeover speculation</u> -

13 the share prices of water stocks have risen in recent years for a number of reasons, part of which

14 may be the possibility of being acquired. The fact that prices rise simply means that either expected

15 returns have changed or that there has been a reassessment of risk. This may also mean that equity

16 cost rates have changed as well. Nonetheless, these conditions by themselves do not mean that the

17 DCF model does not provide an accurate indicator of equity cost rates.

18   (2) <u>The assumptions used in the derivation of the DCF model</u> - First, it must be noted that

19 all economic models are derived using fairly restrictive assumptions.   In the DCF model,

20 assumptions such as constant P/E and dividend payout ratios make the model internally consistent.

1   Criticisms of the assumptions of the model are valid if it can be demonstrated that the model is not

2   robust with respect to obvious real world conditions that deviate from these assumptions. No such

3   evidence has been provided in this proceeding. The fact that the DCF model is used almost

4   universally in the investment community and in utility ratemaking is indicative of the robustness of

5   the methodology. The model does not require that investors have an infinite investment horizon.

6   Simply put, the DCF model only presumes that stocks are priced on the basis of current and

7   prospective dividends. Especially in the case of public utility stocks, I believe that this is a

8   reasonable assumption.

9   (3) <u>The assumption of a constant P/E ratio, given that P/E ratios are not constant but change</u>

10   <u>over time</u> - P/E ratios change constantly as new information comes to the market that causes

11   investors to revalue a company's shares (the numerator of the P/E ratio) relative to current earnings

12   (the denominator of the P/E ratio). This new information may be associated with changes in the

13   economic landscape that result in changes in equity cost rates (such as changes in interest rates or

14   investors' risk/return tradeoff). In the context of the DCF model, the fact that P/E ratios change

15   only provides an indication of changes in a firm's share price relative to past earnings. Share prices

16   look forward and are determined by a firm's prospective cash returns discounted to the present by

17   investors' required return. Earnings look backwards and are a function of firm performance and

18   generally accepted accounting conventions.

19   Thus, in the context of the DCF model, the fact that P/E ratios change is simply an

20   indication that new information relating to the economic environment is available and this has

1 caused investors to revalue shares. The DCF is based on expectations, and thus it is also likely that

2 the new information actually results in a change in equity cost rates.

3   (4) <u>The DCF model produces insufficient earnings when market-to-book ratios are above</u>

4 <u>1.0.</u> - The market value of a firm's equity exceeds the book value of equity when the firm is

5 expected to earn more on the book value of investment than investors require. In other words, the

6 expected return on equity capital is greater than the cost of equity capital (the return that investors

7 require). Given the almost universal application of the DCF model in regulatory and investment

8 circles, it is rather obvious that public utilities would not be selling in excess of 2.00 times book

9 value if the DCF model produced insufficient earnings. As such, Mr. Moul's hypothesis is

10 incorrect.

11 **Q. PLEASE PROVIDE A FURTHER EVALUATION OF MR. MOUL'S**

12 **ADJUSTMENT FOR MARKET AND BOOK VALUE DIVERGENCE.**

13 A.   I have four objections to Mr. Moul's adjustment to his DCF equity cost rate to account for

14 the divergence of market and book values. These are:

15   (1) As noted above, the market value of a firm's equity exceeds the book value of equity when

16   the firm is expected to earn more on the book value of investment than investors require.

17   As such, the reason that market values exceed book values is that the company is earning a

18   return on equity in excess of its cost of equity;

19   (2) Financial publications and investment firms report capitalizations on a book value and not a

20   market value basis. In fact, in Interrogatory OCA-R-11, Set IV, Mr. Moul was asked to

1   provide copies of all financial publications that report capital structure on a market value

2   basis. He responded with one publication that reported a market value publication for one

3   company – AEP. Ironically, even that publication noted that the company targets were

4   based on a book value capital structure. The bottom line is that financial publications and

5   investment firms use book values and not market values in reporting to investors;

6   (3) Mr. Moul makes the claim that the market value – book value adjustment was based on the

7   research of Nobel prize winners Modigliani and Miller. Mr. Moul was asked in

8   Interrogatory OCA-R-12, Set IV, to identify exactly where one could find his proposed

9   adjustment in the research of Modigliani and Miller. He was unable to do so. Mr. Moul did

10   state that "The concept of book value capital structures is unique to the utility ratesetting

11   process." This statement is simply incorrect. As discussed about, virtually all financial

12   publications and investment firms report capital structures on a book value basis; and

13   (4) In response to Interrogatory OCA-R-14, Set IV, Mr. Moul indicated that he had proposed

14   the market value – book value adjustment in 36 rates cases. His adjustment has been

15   accepted in two Pennsylvania cases - PAWC (Docket No. R-00016339) and Philadelphia

16   Suburban Water Company ((Docket No. R-00016750). He also claims that it was accepted

17   in Connecticut in a case involving Birmingham Utilities. This claim is suspect. A reading

18   of the Connecticut case decision, which was provided in response to Interrogatory OCA-R-

19   15, Set IV, does not indicate that the 'leverage adjustment' was for the divergence of market

20   and book values. Instead, as discussed on page 31 of the decision, the 'leverage adjustment'

1   was to account for the risk and size of the utility in question. In short, it appears that only

2   the Pennsylvania Public Utility Commission has accepted Mr. Moul's market value – book

3   value adjustment in two recent water cases. In my opinion, the acceptance of this

4   adjustment was in error.

5 **Q. PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. MOUL'S ADJUSTMENT**

6 **FOR MARKET VALUE –BOOK VALUE DIVERGENCE.**

7 A.   The adjustment provides for additional return that is not required by investors. The fact

8   that the market value of a firm's equity exceeds the book value of equity simply reflects that its

9   return on equity is above its cost of equity. Hence, a higher adjusted return is certainly not required.

10   To support this observation, I would point out that (1) virtually all financial publications and

11   investment firms report capital structures on a book value basis, (2) Mr. Moul's adjustment is not

12   supported by the research of Modigliani and Miller, and (3) Mr. Moul's proposed adjustment has

13   not been accepted by other public utility commissions.

14 **Q.   PLEASE REVIEW MR. MOUL'S RISK PREMIUM ANALYSIS.**

15 A.   Mr. Moul arrives at a risk premium derived equity cost rate of 11.75% for the Water Group

16   and 12.00% for the LDC Group. These figures include a base yield of 7.0 % and equity risk

17   premiums of 4.75% for the Water Group and 5.00% for the LDC Group. These equity cost

18   estimates are excessive due to an overstated base yield and biased and inflated equity risk premiums

19   that do not reflect today's investment fundamentals.

20 **Q.   PLEASE DISCUSS THE BASE YIELD OF MR. MOUL'S RISK PREMIUM**

1 **ANALYSIS.**

2 A. The base yield in Mr. Moul's risk premium analyses is the prospective yield on long-term,

3 'A' rated public utility bonds. Using the yield on these securities inflates the required return on

4 equity for PAWC in two ways: (1) long-term bonds are subject to interest rate risk, a risk which

5 does not affect common stockholders since dividend payments (unlike bond interest payments) are

6 not fixed but tend to increase over time and (2) the base yield in Mr. Moul's risk premium study is

7 subject to credit risk since it is not default risk-free like an obligation of the U.S. Treasury. As a

8 result, its yield-to-maturity includes a premium for default risk and therefore is above its expected

9 return. Hence using such a bond's yield-to-maturity as a base yield results in an overstatement of

10 investors' return expectations.

11 **Q. PLEASE REVIEW MR. MOUL'S RISK PREMIUM STUDY.**

12 A. Mr. Moul performs a historic risk premium study that appears in PAWC Exhibit No. 9-A,

13 Schedule 13. This study involves an assessment of the historic difference between S&P Public

14 Utility Index stock returns and 'A' rated public utility bond returns over various time periods

15 between the years 1928-2001. This type of historic evaluation of stock returns is often called the

16 "Ibbotson approach" after Professor Roger Ibbotson who popularized this method of assessing

17 historic financial market returns. Mr. Moul evaluates the stock-bond return differentials using

18 different measures of central tendency (the geometric and arithmetic means and the median) over

19 four alternative time intervals (1928-2001, 1952-2001, 1974-2001, and 1979-2001). From the

20 results of his study, he concludes that an appropriate risk premium for the S&P Public Utilities is

1   5.32%. To recognize the lower risk of water and gas utilities, he arbitrarily adjusts this figure

2   downwards to 4.75% for the Water Group and 5.00% for the LDC Group. It must be emphasized

3   that this adjustment is totally arbitrary.

4   **Q.   PLEASE SUMMARIZE YOUR ASSESSMENT OF MR. MOUL'S RISK PREMIUM**

5   **STUDY.**

6   A.   Using the historic relationship between stock and bond returns to measure an equity risk

7   premium is erroneous and, especially in this case, overstates the true market equity risk premium.

8   The equity risk premium is based on expectations of the future and when past market conditions

9   vary significantly from the present, historic data does not provide a realistic or accurate barometer

10 of expectations of the future. Currently, using historic returns to measure the equity risk premium

11 masks the dramatic change in the risk and return relationship between stocks and bonds which

12 suggests that the equity risk premium has declined in recent years. As discussed above, the notion

13 that the equity risk premium has declined over the past decade, resulting in higher stock prices and

14 returns, is a well-recognized and accepted fact in today's capital markets.

15 **Q.   PLEASE DISCUSS THE ERRORS IN USING HISTORIC STOCK AND BOND**

16 **RETURNS TO ESTIMATE AN EQUITY RISK PREMIUM.**

17 A.   There are several flaws in using historic returns over long time periods to estimate expected

18 equity risk premiums. Most significant is the implicit assumption that (1) risk premiums do not

19 change over time, and (2) there has been no change in the relative risk of stocks and bonds.

20 Specific problems with the methodology include:

1   (A) Biased historical bond returns;

2   (B) The arithmetic versus the geometric mean return;

3   (C) Unattainable and biased stock historical returns; and

4   (D) The change in risk and return.

5   These issues will be addressed in this order.

6   **Q.   HOW ARE HISTORIC BOND RETURNS BIASED?**

7   A.   An essential assumption of these studies is that over long periods of time investors'

8   expectations are realized. However, the experienced returns of bondholders in the past violate this

9   critical assumption. Historic bond returns are biased downward as a measure of expectancy because

10 of capital losses suffered by bondholders in the past. As such, risk premiums derived from this data

11 are biased upwards.

12 **Q.   PLEASE DISCUSS THE ISSUE RELATING TO THE USE OF THE**

13 **ARITHMETIC VERSUS THE GEOMETRIC MEAN RETURNS IN THE IBBOTSON**

14 **METHODOLOGY.**

15 A.   The measure of investment return has a significant effect on the interpretation of the risk

16 premium results. When analyzing a single security price series over time (i.e., a time series), the

17 best measure of investment performance is the geometric mean return. Using the arithmetic mean

18 overstates the return experienced by investors. In a study entitled "Risk and Return on Equity: The

19 Use and Misuse of Historical Estimates," Carleton and Lakonishok make the following

20 observation: "The geometric mean measures the changes in wealth over more than one period on a

-56-

1   buy and hold (with dividends invested) strategy."[13] Since Mr. Moul's study covers more than one

2   period (and he assumes that dividends are reinvested), he should be employing the geometric mean

3   and not the arithmetic mean.

4   **Q.   PLEASE PROVIDE AN EXAMPLE DEMONSTRATING THE PROBLEM WITH**

5   **USING THE ARITHMETIC MEAN RETURN.**

6   A.   To demonstrate the upward bias of the arithmetic mean, consider the following example.

7   Assume that you have a stock (that pays no dividend) that is selling for $100 today, increases to

8    $200 in one year, and then falls back to $100 in two years. The table below shows the prices and

9   returns.

10

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

11

12   The arithmetic mean return is simply $(100\% + (-50\%))/2 = 25\%$ per year. The geometric mean

13   return is $((2 * .50)^{(1/2)}) - 1 = 0\%$ per year. Hence, the arithmetic mean return suggests that your

14   stock has appreciated at an annual rate of 25%, while the geometric mean return indicates an annual

15   return of 0%. Since after two years, your stock is still only worth $100, the geometric mean return

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[13] 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 is the appropriate return measure. For this reason, when stock returns and earnings growth rates are

2 reported in the financial press, they are normally reported using the geometric mean. This is

3 because of the upward bias of the arithmetic mean. Hence, Mr. Moul's arithmetic mean return

4 measures are biased and should be disregarded.

5 **Q. YOU NOTE THAT HISTORIC STOCK RETURNS ARE BIASED USING THE**

6 **IBBOTSON METHODOLOGY. PLEASE ELABORATE.**

7 A. Returns developed using Ibbotson's methodology are computed on stock indexes and

8 therefore (1) cannot be reflective of expectations because these returns are unattainable to investors,

9 and (2) produce biased results. This methodology assumes (a) monthly portfolio rebalancing and

10 (b) reinvestment of interest and dividends. Monthly portfolio rebalancing presumes that investors

11 rebalance their portfolios at the end of each month so as to have an equal dollar amount invested in

12 each security at the beginning of each month. The assumption would obviously generate extremely

13 high transactions costs and, as such, these returns are unattainable to investors. In addition, an

14 academic study demonstrates that the monthly portfolio rebalancing assumption produces biased

15 estimates of stock returns.[14]

16 Transaction costs themselves provide another bias in historic versus expected returns. The

17 observed stock returns of the past were not the realized returns of investors due to the much higher

18 transactions costs of previous decades. These higher transactions costs were not only the higher

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

1 commissions on stock trades, but also the lack of low cost mutual funds like index funds.

2 **Q.   FINALLY, PLEASE DISCUSS THE NOTION THAT MR. MOUL'S RISK**

3 **PREMIUM STUDIES DO NOT REFLECT THE CHANGE IN RISK AND RETURN IN**

4 **TODAY'S FINANCIAL MARKETS.**

5 A.   The methodology employed by Mr. Moul is also unrealistic in that it makes the explicit

6 assumption that (1) the chosen time horizon is appropriate for estimating the current market risk

7 premium, and (2) risk premiums do not change over time. These assumptions are not valid in

8 today's environment. Economic developments over the past decade have changed the economy and

9 business cycle and have resulted in a dramatic change in the risk/return relationship between stocks

10 and bonds. The nature of the change is that bonds have increased in risk relative to stocks.

11   Page 1 of Schedule JRW-10 shows interest rates on long-term government bonds since

12 1926. Obviously, the interest rate levels of the past twenty years are significantly above those of the

13 previous 50 years. Page 2 of Schedule JRW-9 provides the annual market risk premiums for the

14 1926 to 2002 period where the annual premium is defined as the return on common stock minus the

15 return on long-term Treasury Bonds. There is considerable variability in this series and a clear

16 decline in recent decades. The high was 54% in 1933 and the low was -38% in 1931. Clear

17 evidence of a change in the relative riskiness of bonds and stocks is provided on page 3 of Schedule

18 JRW-10 which plots the standard deviation of annual stock and bond returns since 1926. The plot

19 shows that, whereas stock returns were much more volatile than bond returns from the 1920s to the

1   1970s, bond returns became more variable than stock returns during the 1980s. In recent years the

2   volatility of stocks and bonds have been much more similar to each other. The decrease in the

3   volatility of stocks relative to bonds has been attributed to several stock related factors - the impact

4   of technology on productivity and the new economy, the role of information (see Federal Reserve

5   Chairman Greenspan's comments on pages 35 and 36) on the economy and markets, better cost and

6   risk management by businesses - and several bond related factors - deregulation of the financial

7   system, inflation fears and interest rates, and the increase in the use of debt financing. Further

8   evidence of the greater relative riskiness of bonds is shown on page 4 of Schedule JRW-10, which

9   plots real interest rates (the nominal interest rate minus inflation) from 1926 to 2002. Real rates

10   have been well above historic norms during the past 10-15 years. These high real interest rates

11   reflect the fact that investors view bonds as riskier investments.

12   The net effect of the change in risk and return has been a significant decrease in the return

13   premium that stock investors require over bond yields. In short, the equity or market risk premium

14   has declined in recent years. As I highlighted earlier in my testimony, this decline has been

15   discovered in studies by leading academic scholars and investment firms, and has been

16   acknowledged by government regulators. As such, Mr. Moul's historic market risk premium

17   analysis is simply outdated and not reflective of current investor expectations and investment

18   fundamentals.

19   **Q.   PLEASE SUMMARIZE YOUR RECOMMENDATIONS CONCERNING MR.**

20   **MOUL'S RISK PREMIUM ANALYSIS.**

1   A.   Mr. Moul's risk premium study is erroneous and should be disregarded in estimating PSC's

2   equity cost rate. As indicated, the base yield of 7.00% (1) includes interest rate risk, a risk not

3   generally faced by equity investors, and (2) is above investors' expected return on medium-term

4   public utility bonds. The equity risk premium of 4.75% for the Water Group and 5.00% for the

5   LDC Group are based on a historic risk premium study of stock and bond returns over periods of up

6   to 75 years that (1) employs biased bond returns; (2) uses the arithmetic mean return, (3) utilizes

7   biased and unattainable stock returns, and (4) most importantly, masks the change in the relative

8   risk of stocks and bonds and the resulting decline in the equity risk premium.

9   **Q.   PLEASE ASSESS MR. MOUL'S USE OF THE CAPITAL ASSET PRICING**

10   **MODEL.**

11   A.   Mr. Moul applies the CAPM to the water group to estimate an equity cost rate for the

12   Company. For the CAPM, Mr. Moul computes an equity cost rate of 13.87% for the Water Group

13   and 13.87% for the LDC Group. In arriving at these figures, he uses a 30-year risk-free rate of

14   5.00%, adjusted betas of .84 for both the Water and Gas Groups and a market or equity risk

15   premium of 10.56%. The beta he employs has been adjusted upwards for the book value/market

16   value capitalization difference, and the market or equity risk premium is an average of the historic

17   risk premium (the difference between the arithmetic mean returns on the S&P 500 and long-term

18   Treasuries), and expected returns (the difference between *Value Line's* expected market return and

19   the 30-year Treasury rate).

20   The primary problem with Mr. Moul's CAPM analysis is the size of the market or equity

1   risk premium. He has also erred in adjusting the beta due to the book value/market value issue.

2   This issue has been addressed above and will not be discussed here.

3   **Q.   PLEASE DISCUSS THE ERRORS IN MR. MOUL'S EQUITY OR MARKET RISK**

4   **PREMIUM IN HIS CAPM APPROACH.**

5   A.   Mr. Moul performs an analysis in PAWC Exhibit No. 9-A, Schedule 14, to arrive at his

6   market risk premium of 10.56%. It is computed as the average of the 1926-2001 results from the

7   Ibbotson study (6.4%) and *Value Line's* 3-5 year annual return projections (14.71%). The primary

8   problem with this approach is that both the Ibbotson study and *Value Line* projected return overstate

9   the market or equity risk premium.

10   It should be emphasized that Mr. Moul's CAPM study should be ignored due to the size and

11   direction of his equity risk premium estimate. It is totally out of line with the equity risk premium

12   estimates discovered in recent academic studies and those employed by leading investment banks

13   (2-4 percent, as cited above). Furthermore, whereas Mr. Moul shows an increasing equity risk

14   premium over the past decade, the rest of the investment world, including Mr. Greenspan, believe

15   that the equity risk premium is declining.[15]

16   The Ibbotson historic risk premium simply represents the difference in the arithmetic mean stock

17   and bond returns over the 1926-2001 period. The errors in using the relationship between long-

18   term historic stock and bond returns, using arithmetic mean returns, and other factors were

19   discussed above. In short, the procedure is erroneous and overstates the true market or equity risk

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[15]   Using the same methodology in the 1997 Pennsylvania American Water Company base rate case (R-00973944),

1 premium. Most importantly, using long-term historic returns masks the dramatic change in the risk

2 and return relationship between stocks and bonds that suggests that the market risk premium has

3 declined.

4 Q. PLEASE CRITIQUE MR. MOUL'S PROSPECTIVE EQUITY OR MARKET RISK

5 PREMIUM WHICH HE CALCULATES USING *VALUE LINE'S* PROJECTED

6 RETURNS.

7 A. The primary error in using *Value Line's* 3-5 year annual return projections is that these

8 projections are consistently high relative to actual experienced returns and, as such, provide

9 upwardly biased equity or market risk premiums. This bias is highlighted in a study shown in

10 Schedule JRW-11. Over the 1984-2002 time period, this study demonstrates that *Value Line's*

11 projected 3-5 year annual return has been, on average, 4.68 percent above the actual 3-5 year annual

12 return. As such, *Value Line's* 3-5 year annual returns produce upwardly-biased equity or market

13 risk premiums.

14 Q. TO CONCLUDE THIS DISCUSSION, PLEASE SUMMARIZE MR. MOUL'S

15 RISK PREMIUM AND CAPM RESULTS IN LIGHT OF THE EVIDENCE ON RISK

16 PREMIUMS IN TODAY'S MARKETS.

17 A. Both Mr. Moul's risk premium and CAPM methods are effectively risk premium

18 approaches to estimating equity cost rates. And the primary issue in both cases is the magnitude

19 of the equity or market risk premium. Mr. Moul's risk premium and CAPM studies should be

---

Mr. Moul estimated an equity risk premium of 6.74%.

1   totally ignored due to the size of his equity risk premium estimates. They are totally out of line with

2   the equity risk premium estimates (a) discovered in recent academic studies by leading finance

3   scholars and (b) employed by leading investment banks. In both cases, a more realistic market risk

4   premium is in the 2-4 percent range. Furthermore, even Federal Reserve Chairman Mr. Greenspan

5   believes that the equity risk premium has declined.

6   **Q.   USING A MORE REALISTIC EQUITY RISK PREMIUM, WHAT EQUITY COST**

7   **RATE WOULD MR. MOUL GET USING THE CAPM?**

8   A.   Using the current 30-Treasury rate (5.0%), the average unadjusted beta for the water service

9   group (0.69), and the average equity risk premium from the Fama-French study

10   ([2.55%+4.32%]/2=3.45%, an equity cost rate of 7.40% is indicated.

11   **CAPM Equity Cost Rate**

12		=	Risk-Free Rate	+	Beta	*	Equity Risk Premium		
13	Water Group =		5.00%	+	0.65	*	3.45%	=	7.24%
14	LDC Group =		5.00%	+	0.69	*	3.45%	=	7.38%

15   **Q.   PLEASE DISCUSS MR. MOUL'S COMPARABLE EARNINGS ANALYSIS.**

16   A.   Mr. Moul also estimates an equity cost rate for the Company employing the comparable

17   earnings approach. His methodology involves averaging historic and prospective returns on

18   common equity for a proxy group of non-utility companies "comparable" in risk to his barometer

19   group as determined from screening *Value Line's* Value Screen database. Mr. Moul screens the

20   database on six risk measures and arrives at a group of 54 unregulated "comparable" companies.

1 The average of the historic and projected median returns on common equity for the group is

2 14.20%.

3   This approach is fundamentally flawed for several reasons. He has not performed any

4 analysis to examine whether his return on equity figures are likely measures of long-term earnings

5 expectations. More importantly, however, since Mr. Moul has not evaluated the market-to-book

6 ratios for these companies, he cannot indicate whether the past and projected returns on common

7 equity are above or below investors' requirements. These returns on common equity are excessive

8 if the market-to-book ratios for these companies are above 1.0. For example, Campbell Soup and

9 UST are two of his companies 'comparable' to PAWC. The average historic and projected returns

10 on equity for Campbell Soup (UST) are 61.5% and 53.5% (135.8% and 58.0%), respectively. But,

11 I doubt if any financial analyst, including Mr. Moul, would suggest that these are the equity cost

12 rates for these two companies. Indeed, the market-to-book ratios for Campbell Soup and UST are

13 40.0 and 34.4, which indicates that their return on equity are well above their cost of equity.

14 **Q.   MR. MOUL USES INTEREST COVERAGE AS A TEST OF REASONABLENESS**

15 **IN THIS PROCEEDING. PLEASE COMMENT.**

16 A.   Mr. Moul uses interest coverage as a test of reasonableness and highlights that his rate of

17 return recommendation would produce interest coverage for PAWC of 3.43X. He believes that this

18 indicates that his return recommendation is reasonable. It appears to be more than reasonable since

19 the average interest coverage ratio for the water service group, as shown in Schedule JRW-2, is

20 only 3.0X.

1   But the bigger issue is the use of interest coverage as a test of reasonableness. In contrast

2   to Mr. Moul's discussion of the strict coverage and capitalization guidelines that rating agencies

3   require to maintain a certain bond rating, these guidelines are often violated. I have used market-

4   to-book ratios relative to earned returns on equity as a means of testing my overall rate of return

5   recommendation. As discussed above, this procedure involves a straightforward relationship

6   between a firm's return on equity, cost of equity, and market-to-book ratio. A firm which earns a

7   return on equity above (below) its cost of equity will see its common stock sell at a price above

8   (below) its book value.

9   **Q.   DOES THIS CONCLUDE YOUR TESTIMONY?**

10   A.   Yes it does.

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Appendix A

**EDUCATIONAL BACKGROUND, RESEARCH,
AND RELATED BUSINESS EXPERIENCE**

J. RANDALL WOOLRIDGE

J. Randall Woolridge is a Professor of Finance, the Goldman, Sachs & Co. and Frank P. Smeal Endowed Faculty Fellow in Business Administration, and Director of the Smeal College Trading Room in the College of Business Administration of the Pennsylvania State University in University Park, PA. 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 company 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 and Cornell College as well as the Pennsylvania State University. These courses include corporation finance, commercial and investment banking, and investments at the undergraduate and graduate 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, he has provided commentary on CNN's *Money Line* and CNBC's *Business Today.*

Professor Woolridge is the co-author of two recently published books: *Spinoffs and Equity Carve-Outs: Achieving Faster Growth and Better Performance* (Financial Executives Research Foundation) and *The StreetSmart Guide to Valuing a Stock* (2nd edition - McGraw-Hill). He also has a new textbook being published this year entitled *Modern Corporate Finance, Capital Markets, and Valuation* (Kendall Hunt). Dr. Woolridge is a founder and a managing director of www.valuepro.net - a stock valuation website.

Professor Woolridge has consulted with and prepared research reports for private businesses, investment banking firms, and government agencies (including the National Association of Security Dealers, the Federal Home Loan Bank Board, and the Securities and Exchange Commission). In addition, he has directed and participated in over 350 company-sponsored professional development programs for executives in more than 20 countries in North and South America, Europe, Asia, and Africa. His clients have included major corporations and financial institutions around the world.

1   Dr. Woolridge has prepared testimony on behalf of the Pennsylvania Office of Consumer Advocate in the
2   following cases before the Pennsylvania Public Utility Commission: Bell Telephone Company (R-811819), Peoples
3   Natural Gas Company (R-832315), Pennsylvania Power Company (R-832409), Western Pennsylvania Water Company
4   (R-832381), Pennsylvania Power Company (R-842740), Pennsylvania Gas and Water Company (R-850178),
5   Metropolitan Edison Company (R-860384), Pennsylvania Electric Company (R-860413), North Penn Gas Company (R-
6   860535), Philadelphia Electric Company (R-870629), Western Pennsylvania Water Company (R-870825), York Water
7   Company (R-870749), Pennsylvania-American Water Company (R-880916), Equitable Gas Company (R-880971), the
8   Bloomsburg Water Co. (R-891494), Columbia Gas of Pennsylvania, Inc. (R-891468), Pennsylvania-American Water
9   Company (R-90562), Breezewood Telephone Company (R-901666), York Water Company (R-901813), Columbia Gas
10   of Pennsylvania, Inc. (R-901873), National Fuel Gas Distribution Company (R-911912), Pennsylvania-American Water
11   Company (R-911909), Borough of Media Water Fund (R-912150), UGI Utilities, Inc. - Electric Utility Division (R-
12   922195), Dauphin Consolidated Water Supply Company - General Waterworks of Pennsylvania, Inc, (R-932604),
13   National Fuel Gas Distribution Company (R-932548), Commonwealth Telephone Company (I-920020), Conestoga
14   Telephone and Telegraph Company (I-920015), Peoples Natural Gas Company (R-932866), Blue Mountain
15   Consolidated Water Company (R-932873), National Fuel Gas Company (R-942991), UGI - Gas Division (R-953297),
16   UGI - Electric Division (R-953534), Pennsylvania-American Water Company (R-973944), Pennsylvania-American
17   Water Company (R-994638), Philadelphia Suburban Water Company (R-004868), Pennsylvania-American Water
18   Company (R-00011663) and Philadelphia Suburban Water Company ((Docket No. R-00016750). He has prepared
19   testimony on behalf of the Pennsylvania Office of Consumer Advocate in the following case before the Federal Energy
20   Regulatory Commission (National Fuel Gas Supply Corporation (RP-92-73-000). He has prepared testimony for the
21   New Jersey Department of the Public Advocate, Division of Rate Counsel: New Jersey-American Water Company (R-
22   91081399J), New Jersey-American Water Company (R-92090908J), and Environmental Disposal Corp (R-94070319).
23   He has prepared testimony for the Hawaii Office of the Consumer Advocate: East Honolulu Community Services, Inc.
24   (Docket No. 7718). He has prepared testimony for the County of Nassau in New York State: Long Island Lighting
25   Company (PSC Case No. 942354). He has prepared testimony for the Office of Consumer Counsel in Connecticut:
26   United Illuminating (Docket No. 96-03-29). He has prepared testimony for the Office of the People's Counsel in the
27   District of Columbia: Potomac Electric Power Company (Formal Case No. 939).
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