Exhibit No.:	
Issues:	Return on Equity, Capital Structure
Witness:	Pauline M. Ahern
Exhibit Type:	Surrebuttal
Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2007-0216 SR-2007-0217
Date:	July 27, 2007

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2007-0216
SR-2007-0217

SURREBUTTAL TESTIMONY

OF

PAULINE M. AHERN

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF MISSOURI-AMERICAN WATER COMPANY FOR AUTHORITY TO FILE TARIFFS REFLECTING INCREASED RATES FOR WATER AND SEWER SERVICE	)))))	**CASE NO. WR-2007-0216 SR-2007-0217**

AFFIDAVIT OF PAULINE M. AHERN

Pauline M. Ahern, being first duly sworn, deposes and says that she is the witness who sponsors the accompanying testimony entitled "Surrebuttal Testimony of Pauline M. Ahern"; that said testimony and schedules were prepared by her and/or under her direction and supervision; that if inquiries were made as to the facts in said testimony and schedules, she would respond as therein set forth; and that the aforesaid testimony and schedules are true and correct to the best of her knowledge.

Pauline M. Ahern

State of New Jersey
County of Burlington
SUBSCRIBED and sworn to
Before me this 25th day of July 2007.

Notary Public

My commission expires:

SHARON M. KEEFE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES JULY 9, 2011

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I. INTRODUCTION

Q. Please state your name, occupation and business address.

A. My name is Pauline M. Ahern and I am a Principal of AUS Consultants. My business address is 155 Gaither Drive, Suite A, Mount Laurel, New Jersey 08054.

Q. Are you the same Pauline M. Ahern who previously submitted direct and rebuttal testimonies in this proceeding?

A. Yes, I am.

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to respond to the true-up direct and rebuttal testimonies of David Murray, witness for the Missouri Public Service Commission Staff (the Staff). Specifically, I will respond to his continued recommendation of Missouri American Water Company's (MAWC) parent consolidated capital structure and his criticisms of my recommended common equity cost rate.

I will also address the rebuttal testimony of Missouri Industrial Energy Consumers (MIEC) Witness Michael Gorman regarding his comments on my recommended common equity cost rate.

Q. Have you prepared schedules in support of your surrebuttal testimony?

A. Yes, I have. They have been marked for identification as Schedules PMA-30 through PMA-36.

II. SUMMARY

Q. Please briefly summarize your testimony.

A. This testimony first focuses upon Mr. Murray's erroneous position with regard to his recommendation of capital structure and related ratios, which should not be used for ratemaking purposes for Missouri American Water Company (MAWC) in the current proceeding for all the reasons previously provided in my rebuttal testimony.

With regard to common equity cost rate, I will first demonstrate why his use of a third party's analysis to support a lower overall rate of return is unfounded. I will also show that his criticisms of my methodologies, specifically the use of multiple cost of common equity cost rate models; my use of forecasted yields in the Risk Premium Model (RPM) and Capital Asset Pricing Model (CAPM); my use of the arithmetic mean equity risk premium in the RPM and CAPM; my use of the income return on long-term U.S. Treasury securities in the CAPM; my use of the Empirical CAPM (ECAPM); and my use of the Comparable Earnings Model (CEM) are misplaced and result in a recommendation on his part which is contrary to regulatory consensus and common sense. The cost rate for common equity capital is not, and should not be, the result of a mechanical application of a cost of equity model(s).

In addition, I address MIEC Witness Gorman's comments regarding my recommended common equity cost rate. Specifically, I will address his

comments regarding recently authorized returns on equity; his criticisms of my use of the single-stage growth DCF and earnings per share (EPS) growth forecasts; his criticisms of my use of projected bond yields in my RPM and CAPM analysis; and his misunderstanding of the RPM, ECAPM and CEM.

III. CAPITAL STRUCTURE

Q. In his true-up direct testimony, filed on July 19, 2007, Mr. Murray recommends the use of the Thames Water Aqua US Holdings, Inc. (TWAUSHI or the Parent) (formerly American Water) May 31, 2007 capital structure for ratemaking purposes for MAWC. Please comment.

A. The TWAUSHI capital structure at May 31, 2007 which Mr. Murray recommends includes a common equity ratio of **_____** as shown on Schedule 1 accompanying his true-up direct testimony. While a common equity ratio of **_____** is reasonable, albeit slightly conservative, relative to the common equity ratios maintained on average by the companies in Mr. Murray's comparable group, the six AUS Utility Reports water companies and the four Value Line (Std. Ed.) water companies which averaged 49.38%, 48.97% and 51.25% for the year 2006 as shown on page 2 of Schedule PM-17, it remains inappropriate to rely upon the Parent's consolidated capital structure for ratemaking purposes for MAWC for all the reasons provided in my rebuttal testimony at pages 5-15.

To summarize, MAWC's stand-alone capital structure ratios are appropriate for ratemaking purposes for five reasons; 1) MAWC is a separate corporate entity that issues its own debt and equity and therefore has an independently determined capital structure, 2) MAWC's stand-alone capital structure represents the actual capital financing MAWC's jurisdictional rate base to which rates set in this proceeding will be applied; 3) MAWC's stand-alone capital structure is consistent with the capital structure ratios maintained, on average, by other water companies; 4) MAWC's stand-alone capital structure is consistent with S&P's financial target ratios of total debt to total capital criteria utilities; and 5) MAWC's stand-alone capital structure is consistent with the capital structures allowed by the Missouri Public Service Commission (MoPSC).

More specifically, Company Witness James M. Jenkins also addresses Mr. Murray's position on capital structure. I concur with his entire testimony on the subject, specifically regarding the stand-alone credit rating or lack thereof of MAWC and the relative risk of MAWC and American Water.

In view of the foregoing, the MoPSC should reject Mr. Murray's recommended Parent consolidated capital structure ratios and adopt MAWC's true-up capital structure ratios at May 31, 2007 as shown on Schedule JMJ-5 in authorizing an overall rate of return in the instant docket.

IV. COMMON EQUITY COST RATE

A. Staff Witness David Murray's Comments

Q. At page 12, line 15 through page 14, line 12 of his rebuttal testimony Mr. Murray discusses MAWC's response to Staff Data Request No. 100.1. Please comment.

A. MAWC's response to Staff Data Request No. 100.1 was a confidential valuation study conducted by Duff & Phelps, LLC (D&P). It is inappropriate to rely upon D&P's conclusions to test the reasonableness of either Mr. Murray's or my recommended return rates on common equity for three reasons. **

Q.

A.

Q. _____

A. _____

[redacted]** Regarding fundamental betas, Morin[2] states:

> The fundamental beta of a security is the weighted average of its relative response coefficients, each weighted by the proportion of total variance in market returns due to that specific event. To compute fundamental beta, it is necessary to consider the sources of economic events, to project the reaction of the security to such moves, and to assign probabilities to the likelihood of each possible type of economic event.
>
> To forecast fundamental betas, Rosenberg uses a multiple regression equation similar to Equation 3-12, but with considerably more variables. A vast array of variables on market variability, earnings variability, financial risk, size growth, and a multitude of company and industry characteristics is used to capture differences between betas of various companies and industries. Fundamental betas, which are commercially available from the firm of BARRA, are of the form.
>
> $B = a_0 + a_1 Factor_1 + a_2 Factor_2 + a_3 Factor_3 + \ldots$ etc. (3-13)
>
> The weightings are based on historical estimates. The advantage of the approach is that it uses fundamental company data that are related to risk. *The disadvantage is that the final regression equation 3-13 is arbitrary.* (italics added for emphasis.)

[2] Roger A. Morin, New Regulatory Finance, Public Utilities Reports, Inc., 2006, p. 86.

In addition, to the best of my knowledge and experience in regulatory ratemaking over the last nearly twenty years, I have rarely, if ever, seen BARRA betas used for setting an authorized return rate on common equity for a regulated utility. In my opinion, the Value Line Investment Survey betas utilized by Mr. Murray and myself are more appropriate for a CAPM analysis for ratemaking and cost of capital purposes.

**

[redacted]

Q. [redacted]

[redacted]

A. [redacted]

[redacted]

Q. [redacted]

[redacted]

A. [redacted]

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[redacted]**

Q. At lines 14 and 15 on page 20 of his rebuttal testimony, Mr. Murray states that "a proper application of the DCF indirectly incorporates investors' use of all models for discount rate estimation." Please comment.

A. This statement implies exclusive reliance upon the DCF model when estimating the cost rate of common equity. The Efficient Market Hypothesis (EMH), upon which all cost of common equity models are premised, confirms that investors rely upon multiple cost of common equity models in formulating their required rates of return as discussed in my direct testimony at page 22, lines 1 through 12. My direct testimony also provides, at page 22, line 17 through page 24, line 39, academic support from Charles F. Phillips, Jr. and Roger A. Morin, who cites Eugene F. Brigham and Stewart Myers, that multiple cost of common equity cost rate models should be utilized when assessing investors' required returns. As stated in my direct testimony, at page 24, lines 37-39, "[i]n view of the foregoing, it is clear that investors are or should be aware of all of the models available for use in determining a common equity cost rate. The EMH requires the assumption that, collectively, investors consider them all."

Moreover, if Mr. Murray's assertion is true, that the DCF indirectly incorporates investors' use of all models for discount rate estimation, it is only true to the extent that these expectations are reflected in the market price and hence, dividend yield, component of the DCF. The accounting measures of growth used by rate of return analysts, be they historical or

projected, earnings per share growth, dividends per share growth, book value per share growth, cash flow per share growth, sustainable growth, etc., are but proxies for market price appreciation and are based upon accounting measures which do not reflect investors use of multiple cost of common equity cost rate models.. Such accounting measures are independent of investor expectations and therefore, can not incorporate "investors' use of all models for discount rate estimation."

Consequently, a proper application of the DCF model does not indirectly incorporate "investors' use of all models for discount rate estimation."

Q. At page 20, lines 17-20 of his rebuttal testimony, Mr. Murray states that you believe "an unadjusted DCF cost of common equity estimate would understate the cost of common equity when market-to-book ratios are above one because the cost of common equity is applied to [a] book value rate base." Please comment.

A. Nowhere in my direct testimony did I recommend or even suggest that the results of the DCF model be adjusted because of its tendency to mis-specify the investors true required rate of return on common equity when market-to-book values are significantly greater than or less than one. My testimony is that "[t]he extent to which the DCF is relied upon should depend upon the extent to which the cost rate results differ from those resulting from the use of other cost of common equity models because the DCF model has a tendency

to mis-specify investors' required return rate when the market value of common stock differ significantly from its book value." This mis-specification arises because, in many instances, market prices reflect investors' expectations of long-range market price growth potentials (consistent with the infinities' investment horizon implicit in the standard regulatory version of the DCF model) not fully reflected in analysts' shorter range forecasts of future growth for earnings per share and dividends per share accounting proxies. What I do recommend in my direct testimony as discussed previously is the need to rely upon multiple cost of common equity cost rate models consistent with the EMH.

Q. On page 21, line 7 through page 22, line 7 of his rebuttal testimony, Mr. Murray discusses his disagreement with your use of forecasted yields in the RPM and the CAPM. Please comment.

A. As discussed in my rebuttal testimony and previously in this testimony, ratemaking and the cost of capital are both prospective. Therefore, the appropriate yields to use in the RPM and CAPM are forecasted yields. In addition Roger A. Morin states[3]:

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g. The accuracy of these forecasts in the sense of whether they turn out to be correct is not at issue here, as long as they reflect widely held expectations. As long as the

[3] Id., at pp. 298-299.

> forecasts are typical and/or influential in that they are consistent with current stock price levels, they are relevant. The use of analysts' forecasts in the DCF model is sometimes denounced on the grounds that it is difficult to forecast earnings and dividends for only one year, let alone for longer time periods. This objection is unfounded, however, because it is present investors expectations that are being priced; it is the consensus forecast that is embedded in price and therefore in required return, and not the future as it will turn out to be.
>
> * * *
>
> Academic research confirms the superiority of analysts' earnings forecasts over univariate time-series forecasts that rely on history. This latter category includes many *ad hoc* forecasts from statistical models, ranging from the naïve methods of simple averages, moving averages, etc. to the sophisticated time-series techniques such as the Box-Jenkins modeling techniques. The literature suggests that analysts' earnings forecasts incorporate all the public information available to the analysts and the public at the time the forecasts are released. This finding implies that analysts have already factored historical growth trends into their forecast growth rates, making reliance on historical growth rates somewhat redundant and, at worst, potentially double counting growth rates which are irrelevant to future expectations. Furthermore, these forecasts are statistically more accurate than forecasts based solely on historical earnings, dividends, book value equity, and the like.

Although the foregoing quote by Morin is relative to analysts' growth rate projections, the principles apply equally to interest rate projections. Financial analysts do exert a strong influence on the expectations of investors, whether it be with forecasts of growth for use in the DCF or forecasts of interest rate levels. Not only do analysts' earnings forecasts incorporate all the public information available to them and the public at the time of the forecasts, so

do analysts' forecasts of interest rate levels. Therefore, the use of current yields in the RPM and CAPM is not appropriate. Forecasts of corporate, public utility and U.S. Treasury bond yields are appropriate.

Q. On line 22 of page 21 of his rebuttal testimony, Mr. Murray states that "[i]t is "logical to use current yields for the same reason it is logical to use current stock prices in the DCF model." Please comment.

A. Taken to its logical conclusion, such a statement leads to the notion that a proper application of the DCF model should only include the dividend yield component, as the market price used in the denominator of the dividend yield would already reflect investors' growth expectations. Such a conclusion is clearly illogical and inconsistent with DCF theory which states that an investor realizes a return on his market investment based upon income received, i.e., dividends, and capital appreciation, i.e., market price growth. Equally illogical then is Mr. Murray's statement on page 22 of his rebuttal testimony, at lines 4-6, where he states "it would not be appropriate to use some future estimate of what the stock price may be a year or so into the future to determine the current cost of common equity." But that is precisely what the growth component of the DCF model does. The standard regulatory version of the DCF which Mr. Murray and I have utilized assumes a terminal price at some point in the future, which is infinity for the constant growth version of the DCF. In addition, the growth estimates utilized by Mr. Murray and myself, i.e., earnings growth, dividend growth, internal growth,

and the like are but proxies for market price appreciation. Consequently, future stock prices are indeed implicit in the DCF model.

Q. Mr. Murray criticizes your use of arithmetic means in your RPM and CAPM analyses on pages 22 and 24, respectively, of his rebuttal testimony. Please comment.

A. On pages 22 and 23 of his rebuttal testimony, Mr. Murray provides an example to support his contention that using the arithmetic mean is questionable. However, Mr. Murray's mathematical example is questionable because it does not take into account the probability of each outcome, i.e., an increase of 50% in one year and a decrease of 50% in another. As noted in my rebuttal testimony, at page 29, lines 13-15, the financial literature is quite clear that risk is measured by the variability of expected returns, i.e., the probability distribution of returns. The arithmetic mean return and not the geometric mean return provides insight into the variance and standard deviation of returns, i.e., risk, without which investors cannot meaningfully evaluate prospective risk. An example, similar to Mr. Murray's, is given on page 4 of Schedule PMA-22 which demonstrates that the proper expected value is predicted by compounding the arithmetic mean and not the geometric mean. In other words, it is the arithmetic mean which must be compounded over a period of time in order to achieve the terminal wealth value which gives rise to the compound average or geometric return. As noted on page 4 of Schedule PMA-12, "[t]he arithmetic mean equates the

expected future value with the present value; it is therefore the appropriate discount rate. "

Q. On pages 24 and 25 of his rebuttal testimony, Mr. Murray criticizes your use of the income return on long-term U.S. Government bonds and not the total return. Please comment.

A. Mr. Murray states that the investor will receive only the income return if he holds the bond until maturity. Otherwise, he / she will receive a total return based upon changes in the price of the bond and reinvestment returns. Mr. Murray states that if earned return spreads are used to estimate risk premia, "it is appropriate to measure the market risk premium by comparing total returns on stocks to total returns on risk-free treasuries because this is what investors will expect to receive." (page 25, lines 1-3 of Mr. Murray's rebuttal testimony.) Such a statement is curious, given that Mr. Murray relies upon the historical equity risk premia data in Stocks, Bonds, Bills and Inflation – Market Results for 1926-2006 – 2007 Yearbook Valuation Edition (2007 Yearbook Valuation Edition), which clearly states on pages 75-76 that the income return and not the total return is appropriate for estimating the equity risk premium because the income return "represents the truly riskless portion of the return." (Schedule PMA-33, page 3)

Q. Please address Mr. Murray's criticism of the ECAPM as discussed at page 25, lines 6-9 of his rebuttal testimony.

A. Although Mr. Murray states that to his knowledge, the ECAPM is not widely discussed in financial texts, he has ignored the discussion of academic and regulatory support for the ECAPM provided in my direct testimony at page 49, line 26 though page 50, line 25 and page 55, line 2 through page 57, line 8. In addition, Mr. Murray cites Aswath Damodaran whom Mr. Murray claims "does not recommend an adjustment to beta for the CAPM." Mr. Murray has apparently confused the adjustment of beta for regression bias, such as the adjusted betas from Value Line which we both utilize, with the ECAPM. As explained in my direct testimony at the pages cited above, it is essential to take into account the reality that the empirical Security Market Line (SML) described by the traditional CAPM is not as steeply sloped as the predicted SML. The ECAPM is thus a return adjustment which accounts for this reality and is not an adjustment to beta which is an x-axis adjustment accounting for regression bias. Schedule PMA-34 is an excerpt from New Regulatory Finance (2006) by Roger A. Morin which summarizes the empirical research on the CAPM and in which he states on page 7 of the Schedule[4]:

> Some have argued that the use of the ECAPM is inconsistent with the use of adjusted betas, such as those supplied by Value Line and Bloomberg. This is because the reason for using the ECAPM is to allow for the tendency of betas to regress toward the mean value of 1.00 over time, and, since Value Line betas are already adjusted for such trend [sic], an ECAPM analysis results in double-counting. This argument is erroneous. Fundamentally, the ECAPM is not an adjustment, increase or decrease, in beta. This is obvious from the fact that the expected return on high beta securities is actually lower

[4] Id., at p. 191

than that produced by the CAPM estimate. The ECAPM is a formal recognition that the observed risk-return tradeoff is flatter than predicted by the CAPM based on myriad empirical evidence. The ECAPM and the use of adjusted betas comprised two separate features of asset pricing. Even if a company's beta is estimated accurately, the CAPM still understates the return for low-beta stocks. Even if the ECAPM is used, the return for low-beta securities is understated if the betas are understated. Referring back to Figure 6-1, the ECAPM is a return (vertical axis) adjustment and not a beta (horizontal axis) adjustment. Both adjustments are necessary.

In addition, Schedule PMA-35 is an excerpt from Financial Management – Theory and Practice, in which Eugene F. Brigham discusses the confusion over the ECAPM and adjusted betas when he states[5]:

> The slope of the SML reflects the degree of risk aversion in the economy – the greater the average investor's aversion to risk, then (1) the steeper is the slope of the line, (2) the greater is the risk premium for any risky asset, and (3) the higher is the required rate of return on risky assets.[12]
>
> [12]Students sometimes confuse beta with the slope of the SML. This is a mistake. As we saw earlier in connection with Figure 6-8, and as is developed further in Appendix 6A, beta does represent the slope of a line, but *not* the Security Market Line. This confusion arises partly because the SML equation is generally written, in this book and throughout the finance literature, as $k_i = R_F + b_i(k_M - R_F)$, and in this form b_i looks like the slope coefficient and $(k_M - R_F)$ the variable. It would perhaps be less confusing if the second term were written $(k_M - R_F)b_i$, but this is not generally done.

Hence, there is no basis for Mr. Murray's criticism of my use of the ECAPM.

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[5] Eugene F. Brigham, Financial Management – Theory and Practice, 4th Ed., The Dryden Press, 1985, p. 203.

Q. At page 25, line 10 through p. 26, line 4 of his rebuttal testimony, Mr. Murray criticizes your use of the CEM. He states at page 25, lines 19-20, "if the allowed returns are set based on expected returns, then it is possible that these returns will remain above the cost of capital." Please comment.

A. This statement by Mr. Murray indicates a lack of understanding of the market prices paid by investors. The DCF model upon which he relies is based entirely upon investor expectations. Sometimes those expectations are met; sometimes returns are greater than expected; and sometimes returns are less than expected. However, it is the expectations of those returns that influence the market prices that investors pay.

Moreover, the CEM has a long, well-established history in utility ratemaking and is based upon the premise that regulation is a substitute for the competition of the marketplace. Since the non-utility companies upon which I rely in my CEM analysis are selected based upon comparable total risk to my proxy groups, the selection bases make the non-price regulated companies comparable in both non-diversifiable, systematic, risk as well as diversifiable, unsystematic risk. Consequently, because they are comparable in total risk, the returns on their book values are relevant to the returns on book values of price regulated companies and hence appropriate for setting an authorized return rate on common equity. Mr. Murray's criticisms should be rejected.

B. MIEC Witness Michael Gorman's Comments

Q. At page 3 of his rebuttal testimony, Mr. Gorman discusses why he believes that recently authorized returns on equity for electric and gas utilities do not support your recommended common equity cost rate. Please comment.

A. Schedule PMA-25 accompanying my rebuttal testimony is a summary of regulatory awards made to electric and gas distribution companies during the period January 1, 2005 through June 30, 2007 derived from Regulatory Research Associates. As stated in my rebuttal testimony at page 39, lines 5-9, "[a]lthough Regulatory Research Associated does not report authorized ROEs [returns on common equity] for water companies, the authorized ROEs for electric and gas distribution companies are relevant to the instant proceeding as MAWC, indeed, all water utilities, compete in the same marketplace for capital as do electric and gas distribution utilities." The average authorized ROE in all litigated cases shown on Schedule PMA-25 is 10.51% relative to a 47.89% common equity ratio, nearly identical to MAWC's true-up May 31, 2007 common equity ratio of 47.81% shown on Schedule JMJ-5. MAWC's 47.81% common equity ratio at May 31, 2007 is also nearly identical to the 2006 common equity ratio for gas utilities shown on Line No.5 of Mr. Gorman's Schedule MPG-1 accompanying his rebuttal testimony. Thus, Mr. Gorman's statement that "there is a discernable difference in the common equity component of capital structure for Missouri-American relative to gas utilities" is incorrect. Mr. Gorman also recommends

lowering MAWC's authorized ROE to "reflect its lower operating risk relative to higher risk gas and electric companies." (lines 13-24 on page 3 of his rebuttal testimony) However, Mr. Gorman has not provided any empirical support that the risk of the electric and gas companies whose average awarded ROEs and common equity ratios are shown on Schedule MPG-1 is lower than that of MAWC.

As also shown on Schedule PMA-25, the average spread between the ROEs awarded in litigated cases from January 2005 through June 2007 and the concurrent average yield on Moody's A rated public utility bonds was 4.67%. Adding this 4.67% spread to the current prospective yield on Moody's A rated public utility bonds of 6.60% yields an ROE of11.27% which supports my recommended common equity cost rate of 11.30% and not Mr. Gorman's recommended 9.7%.

Q. At page 6, line 18 through page 8, line 5 of his rebuttal testimony, Mr. Gorman criticizes your use of analysts' forecasts of earnings per share (EPS) growth in your application of the DCF model. Please comment.

A. My rebuttal testimony, at page 41, line 13 through page 43, line 17 sets forth some of the wealth of empirical and academic literature which support the superiority of analysts" forecasts of EPS as measures of investor expectations. My rebuttal testimony cites an article by John G. Cragg and Burton G. Malkiel (pages 41-42 of the rebuttal testimony) who note that analysts' forecasts are more precise than other growth estimates and whose

results support the notion that "analysts' forecasts are needed even when calculated growth rates are available."[6] Also cited is an article by James H. Vander Weide and Willard T. Carleton whose studies affirmed the superiority of analysts' forecasts as well as a study by Lawrence D. Brown and Michael S. Rozeff which concluded that analysts' forecasts should be used in cost of capital studies until superior forecasts are found. Finally, my rebuttal testimony cites Dr. Myron Gordon who stated in a speech given before the Institute of Quantitative Research in Finance held in Palm Beach, Florida in March 1990 that "estimates by security analysts available from sources such as IBES are far superior to the data available to Malkiel and Cragg. Secondly, the estimates by security analysts must be superior to the estimates derived solely from financial statements."

Therefore, there is no need to reject the empirical evidence of the proven reliability of analysts' forecasts of EPS by turning to a two-stage DCF model as also discussed in my rebuttal testimony.

Q. At page 7, line 20 through page 8, line 19 of his rebuttal testimony, Mr. Gorman continues to advocate the use of a two stage DCF. Please comment.

A. As discussed in my rebuttal testimony at page 48, lines 2-15, while it is intuitively appealing to assume that the growth of all firms will eventually converge upon the growth in GDP, Mr. Gorman has provided no empirical

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[6] Expectations and the Structure of Share Prices, John G. Cragg and Burton G. Malkiel, The University of Chicago Press, 1982, Chapter 4.

evidence that the analysts' forecasted growth in EPS for either the water or gas groups will do so. In his rebuttal testimony, he continues to base his support for the two-stage DCF upon his belief that analysts' forecasted growth rates in EPS, especially for water companies, are "abnormally high". However, based upon the wealth of empirical and academic support for the use of analysts' growth forecasts in EPS in the DCF model as outlined both previously in this surrebuttal testimony and in my rebuttal testimony, to undertake a two-stage DCF analysis is inconsistent with both the empirical evidence as well as Mr. Gorman's direct testimony as noted on page 48 of my rebuttal testimony.

Moreover, as also discussed in my rebuttal testimony on pages 48 and 49, the results of his two-stage DCF analysis fail a common sense test as they are inconsistent with the range of ROEs shown on Schedule PMA-25 as well as those shown in Schedule MPG-1 accompanying his rebuttal testimony.

Q. At page 11, lines 5-10 of his rebuttal testimony, Mr. Gorman discusses two issues he has with your risk premium analysis. Please comment.

A. Mr. Gorman's first issue is my reliance upon projected bond yields. However, as previously discussed in both this surrebuttal testimony as well as in my rebuttal testimony, at page 24, lines 4-13, ratemaking and the cost of capital are both prospective. Financial analysts do exert a strong influence on the expectations of investors, whether it be forecasts of growth for use in

the DCF or forecasts of interest rate levels. Not only do analysts' earnings forecasts incorporate all the public information available to them and the public at the time of the forecasts, so do analysts' forecasts of interest rate levels. Therefore, the use of current yields in the RPM and CAPM is not appropriate. Forecasts of corporate, public utility and U.S. Treasury bond yields are appropriate.

Mr. Gorman's second issue relates to what he claims is my "use of [a] corporate bond yield as a risk-free rate." Nowhere in my testimony do I claim that the corporate bond yield used in the RPM is the risk-free rate. My direct testimony is clear on this issue at page 37, line 22 through page 38, line 17 where it states:

> Q. Some analysts state that the RPM is another form of the CAPM. Do you agree?
>
> A. While there are some similarities, there is a very significant distinction between the two models. The RPM and CAPM both add a "risk premium" to an interest rate. However, the beta approach to the determination of an equity risk premium in the RPM should not be confused with the CAPM. Beta is a measure of systematic, or market, risk, a relatively small percentage of total risk (the sum of both non-diversifiable systematic and diversifiable unsystematic risk). Unsystematic risk is fully captured in the RPM through the use of the prospective long-term bond yield as can be shown by reference to pages 3 through 9 of Schedule PMA-2, which confirm that the bond rating process involves an assessment of all business risks. In contrast, the use of a risk-free rate of return in the CAPM does not, and by definition cannot, reflect a company's specific i.e., unsystematic risk. Consequently, a much larger portion of the total common equity cost rate is reflected in the company-specific bond yield (a product of the bond rating) than is reflected in the

> risk-free rate in the CAPM, or indeed even by the dividend yield employed in the DCF model. Moreover, the financial literature recognizes the RPM and CAPM as two separate and distinct cost of common equity models as discussed previously.

Quite possibly, Mr. Gorman believes my use of a corporate / public utility bond yield "as a risk-free rate" is based on my use of beta to apportion the market equity risk premium to reflect the risk of the two proxy groups of water companies. Roger A Morin provides the rationale for such risk apportionment (see Schedule PMA-36) when he states[7]:

> The risk premium estimates derived from a composite market index must be adjusted for any risk differences between the equity market index employed in deriving the risk premium and a specified utility common stock. Several methods can be used to effect the proper risk adjustment.
>
> * * *
>
> First, the beta risk measure for the subject utility or the beta of a group of equivalent risk companies can service as an adjustment device. The market risk premium, RP_M, is multiplied by the beta of the utility, β_i, to find the utility's own risk premium, RP_i:
>
> $$RP_i = \beta_i RP_M$$
>
> And the beta-adjusted risk premium is added to the bond yield to arrive at the utility's own cost of equity capital.

Clearly, Mr. Gorman is mistaken in his recommendation that my "use of [a] corporate bond yield as a risk-free rate and applying it to the group average beta . . . should be rejected."

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[7] Id., at pp. 119-120.

Q. On page 15, line 11 through page 16, line 21, Mr. Gorman criticizes your use of the ECAPM. Please comment.

A. Like Mr. Murray, Mr. Gorman has confused the adjustment of beta with the ECAPM. As previously discussed in this surrebuttal testimony, my rebuttal testimony and my direct testimony, there is considerable academic and regulatory support for the use of the ECAPM. Moreover, as previously discussed in this surrebuttal testimony and supported by Schedules PMA-34 and 35, The ECAPM is a return adjustment which accounts for the reality that the empirical SML described by the traditional CAPM is not as steeply sloped as the predicted SML and not a beta adjustment which accounts for regression bias.

Q. At page 17, line 19 through page 18, line 12 of his rebuttal testimony, Mr. Gorman criticizes your application of the CEM. Please comment

A. First, Mr. Gorman states at line 22, page 17 through line 2 on page 1 of his rebuttal testimony that "[t]he accounting-based return does not measure the current cost of capital necessary to attract capital in the market place. An accounting return is not derived from the market valuation of security prices. Consequently, it does not measure investors' return requirements." The same can be said for the accounting measures of growth utilized by rate of return analysts such as Mr. Gorman and myself. As stated previously, analysts forecasts of EPS growth are based upon their consensus of accounting based earnings per share. Such accounting measures are

independent of investor expectations and therefore they do not measure investors' return requirements, rather they serve as a proxy for them.

Moreover, regulation is a substitute for the competition of the marketplace. Consequently, it is entirely appropriate to select companies comparable in total investment risk to price regulated utilities. As discussed in my direct testimony at pages 59 and 60, the bases of selection makes the non-price regulated companies comparable in both non-diversifiable, systematic, risk as well as diversifiable, unsystematic, risk. Hence, because they are comparable in total risk, the returns on their book values are relevant to the returns on book values of price regulated companies and hence appropriate for setting an authorized return rate on common equity. Again, Mr. Gorman's criticisms are unfounded and should be disregarded.

Q. Does this conclude your surrebuttal testimony?

A. Yes, it does.

Exhibit No.:	
Issues:	Return on Equity, Capital Structure
Witness:	Pauline M. Ahern
Exhibit Type:	Surrebuttal
Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2007-0216 SR-2007-0217
Date:	July 27, 2007

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2007-0216
SR-2007-0217

EXHIBIT

TO ACCOMPANY THE

SURREBUTTAL TESTIMONY

OF

PAULINE M. AHERN

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

Pauline Ahern

From: Goldenberg, Izabella (MSCIBARRA) [Izabella.Goldenberg@mscibarra.com] on behalf of Client Service [clientservice@mscibarra.com]
Sent: Monday, July 23, 2007 8:39 AM
To: pahern@ausinc.com
Subject: RE: Web Information Request: 'research'
Attachments: Predicted_beta.pdf

Dear Pauline,

Barra Betas are neither adjusted nor regression-based. They are *predicted* betas derived for the Barra Risk Models. Please find attached a description of the Barra Betas.

Best regards,
Izabella

Izabella Goldenberg
MSCI Barra
Wall Street Plaza
88 Pine Street, 2nd Fl
New York, NY 10005
Tel: 212.804.1526
Fax: 212.507.5150
Client Service: 212.762.5790
Izabella.Goldenberg@mscibarra.com

From: pahern@ausinc.com [mailto:pahern@ausinc.com]
Sent: Monday, July 23, 2007 7:48 AM
To: mscibarra_webmail@mscibarra.com
Subject: Web Information Request: 'research'

Dear Client Service,

Please respond to the following website Information Request.

Topic:	feedback
Question or Comment:	I have a question about BARRA's betas and can not find the answer on your website. Are BARRA's betas adjusted for regression bias? Thanks you.
First Name:	Pauline M
Last Name:	Ahern
Email Address:	pahern@ausinc.com
Title:	Principal
Company:	AUS Consultantsq
Address Line 1:	155 Gaither Dr.
Address Line 2:	
City:	Mount Laurel
State:	NJ
Zip or Postal Code:	08054
Country:	US
Phone:	856-234-9200

Fax: 856-234-8371

BARRA

Predicted Beta

BARRA Predicted Beta

Beta is a gauge of the expected response of a stock, bond, or portfolio to the overall market. For example, a stock with a beta of 1.5 has an expected excess return of 1.5 times the market excess return. If the market is up 10% over the risk-free rate, then—other things held equal—the portfolio is expected to be up 15%. Beta is one of the most significant means of measuring portfolio risk and shows a strong relationship to expected return.

Historical Beta vs. Predicted Beta

Historical beta is calculated after the fact by running a regression (often over 60 months) on a stock's excess returns against the market's excess returns. There are two important problems with this simple historical approach:

- It does not recognize fundamental changes in the company's operations. For example, when RJR Nabisco spun off its tobacco holdings in 1999, the company's risk characteristics changed significantly. Historical beta would recognize this change only slowly, over time.

- It is influenced by events specific to the company that are unlikely to be repeated. For example, the December 1984 Union Carbide accident in Bhopal, India, took place in a bull market, causing the company's historical beta to be artificially low.

Predicted beta, the beta BARRA derives from its risk model, is a forecast of a stock's sensitivity to the market. It is also known as *fundamental beta*, because it is derived from fundamental risk factors. In the BARRA model these risk factors include 13 attributes—such as size, yield, and price/earnings ratio—plus industry exposure allocated across a maximum of 6 of 55 industry groups. Because we reestimate these risk factors monthly, the predicted beta reflects changes in the company's underlying risk structure in a timely manner.

BARRA programs use predicted beta rather than historical beta because it is a better forecast of market sensitivity.

Computing Predicted Beta

Below we show how the predicted beta of a portfolio is computed.

The beta of a portfolio p with respect to the market m is defined as the covariance of the portfolio return with the market return divided by the variance of the market:

(1) $$\beta_p = \frac{\mathrm{COV}(r_p, r_m)}{\mathrm{VAR}_m}$$

The covariance between two portfolios is decomposed into two parts: a) the part explained by factors, called *common factor covariance*; and b) the part unexplained by factors, called *specific covariance.*

The factor covariance between portfolio p and the return on the market m is the product of the transposed vector of the factor exposures for the portfolio, the factor covariance matrix, and the vector of the factor exposures for the market:

(2) $$\mathrm{CF\ COV}(r_p, r_m) = X_p^T\ F\ X_m$$

The specific covariance is:

(3) $$\mathrm{SP\ COV}(r_p, r_m) = \sum_{i=1}^{N} h_{pi} h_{mi} \sigma_i^2$$

Now, combining equations (1) and

(4) $\mathrm{COV}(r,r) = \mathrm{VAR}(r)$

we have the formula for the BARRA predicted beta of a portfolio:

(5) $$\beta_p = \frac{\mathrm{COV}(r_p, r_m)}{\mathrm{VAR}_m}$$

$$= \frac{\mathrm{CF\ COV}(r_p, r_m) + \mathrm{SP\ COV}(r_p, r_m)}{\mathrm{CF\ COV}(r_m, r_m) + \mathrm{SP\ COV}(r_m, r_m)}$$

$$= \frac{\sum_{j=1}^{NFAC} \sum_{k=1}^{NFAC} X_{pj} Fjk\, X_{mk} + \sum_{i=1}^{N} h_{pi} h_{mi} \sigma_i^2}{\sum_{j=1}^{NFAC} \sum_{k=1}^{NFAC} X_{mj} Fjk\, X_{mk} + \sum_{i=1}^{N} h_{mi}^2 \sigma_i^2}$$

where

$NFAC$	is the number of factors (68 in U.S. E2)
N	is the number of assets in the market portfolio
X_{pj}	is the portfolio's exposure to factor j
F_{jk}	is the covariance between factors k and j
X_{mj}	is the market's exposure to factor j
h_{pi}	is the holding of the portfolio in asset i
h_{mi}	is the holding of the market in asset i
σ_i^2	is the specific variance of asset i
VAR_m	is the variance of the market

Missouri-American Water Company
Capital Asset Pricing Model (CAPM) Cost-Of-Common-Equity Estimates
for Duff & Phelps' Guideline Companies Corrected
to Reflect a Prospective Risk-Free Rate, Value Line Adjusted Betas,
the Average Historical and Forecasted Market Equity Risk Premium and the
Empirical Capital Asset Pricing Model (ECAPM)

	1	2	3	4	5
	Traditional Capital Asset Pricing Model				
Company Name	Risk-Free Rate (1)	Company's Beta (2)	Market Risk Premium (3)	Beta Adjusted Market Risk Premium (4)	Cost of Common Equity (5)
American States Water Co.	5.30%	0.80	5.80%	4.64%	9.94%
Aqua America, Inc	5.30%	0.90	5.80%	5.22%	10.52%
Artesian Resources, Inc.	5.30%	NA	5.80%	NA	NA
California Water Service Group	5.30%	0.90	5.80%	5.22%	10.52%
Connecticut Water Service	5.30%	0.90	5.80%	5.22%	10.52%
Middlesex Water Co.	5.30%	0.85	5.80%	4.93%	10.23%
SJW Corp.	5.30%	0.70	5.80%	4.06%	9.36%
Southwest Water Co.	5.30%	0.90	5.80%	5.22%	10.52%
York Water Co.	5.30%	0.55	5.80%	3.19%	8.49%
Average	5.30%	0.81	5.80%	4.71%	10.01% (7)

	Empirical Capital Asset Pricing Model				
Company Name	Risk-Free Rate (1)	Company's Beta (2)	Market Risk Premium (3)	Beta Adjusted Market Risk Premium (6)	Cost of Common Equity (5)
American States Water Co.	5.30%	0.80	5.80%	4.93%	10.23%
Aqua America, Inc.	5.30%	0.90	5.80%	5.37%	10.67%
Artesian Resources, Inc.	5.30%	NA	5.80%	NA	NA
California Water Service Group	5.30%	0.90	5.80%	5.37%	10.67%
Connecticut Water Service	5.30%	0.90	5.80%	5.37%	10.67%
Middlesex Water Co.	5.30%	0.85	5.80%	5.15%	10.45%
SJW Corp.	5.30%	0.70	5.80%	4.50%	9.80%
Southwest Water Co.	5.30%	0.90	5.80%	5.37%	10.67%
York Water Co.	5.30%	0.55	5.80%	3.84%	9.14%
Average	5.30%	0.81	5.80%	4.99%	10.29%

Average of Traditional and Empirical CAPM 10.15% (7)

Notes:
(1) From note 2 on page 3 of Schedule PMA-28.
(2) From pages 2 through 9 of this Schedule.
(3) Derived in note 1 on page 3 of Schedule PMA-28.
(4) Column 2 * Column 3.
(5) Column 1 + Column 4.
(6) The empirical CAPM is applied using the formula found in note 4 on page 3 of Schedule PMA-28.
(7) Including only those indicated common equity cost rates which are greater than 8.6%, i.e., 200 basis points above the prospective yield on A rated Moody's public utility bonds of 6.6% (from page 1 of Schedule PMA-27) yields an average traditional CAPM result of 10.26% which when averaged with the average ECAPM result of 10.29% yields an average CAPM result of 10.26%.

AMER. STATES WATER NYSE-AWR

RECENT PRICE 36.70 | P/E RATIO 24.5 (Trailing: 27.6 / Median: 18.0) | RELATIVE P/E RATIO 1.26 | DIV'D YLD 2.6% | VALUE LINE

TIMELINESS 5 Lowered 12/1/06
SAFETY 3 New 2/4/00
TECHNICAL 3 Lowered 4/27/07
BETA .80 (1.00 = Market)

2010-12 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	50	(+35%)	10%
Low	35	(-5%)	2%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	1	0	0	0
Options	3	0	2	0	0	1	0	0	0
to Sell	3	0	2	0	0	2	0	0	0

Institutional Decisions

	2Q2006	3Q2006	4Q2006
to Buy	67	53	59
to Sell	44	56	39
Hld's(000)	8042	8361	8944

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	©VALUE LINE PUB., INC.	10-12
	9.15	10.10	9.27	10.43	11.03	11.37	11.44	11.02	12.91	12.17	13.06	13.78	13.98	13.61	14.06	15.75	15.55	15.80		Revenues per sh	17.25
	1.78	1.81	1.67	1.68	1.75	1.75	1.85	2.04	2.26	2.20	2.53	2.54	2.08	2.23	2.64	2.90	3.10	3.25		"Cash Flow" per sh	3.60
	1.19	1.15	1.11	.95	1.03	1.13	1.04	1.08	1.19	1.28	1.35	1.34	.78	1.05	1.32	1.33	1.55	1.65		Earnings per sh A	2.05
	.73	.77	.79	.80	.81	.82	.83	.84	.85	.86	.87	.87	.88	.89	.90	.91	.94	.97		Div'd Decl'd per sh B■	1.06
	2.77	2.31	1.90	2.43	2.19	2.40	2.58	3.11	4.30	3.03	3.18	2.68	3.76	5.03	4.24	3.91	3.95	3.95		Cap'l Spending per sh	4.00
	8.39	8.85	9.95	10.07	10.29	11.01	11.24	11.48	11.82	12.74	13.22	14.05	13.97	15.01	15.72	16.64	17.80	19.20		Book Value per sh	22.25
	9.91	9.96	11.71	11.77	11.77	13.33	13.44	13.44	13.44	15.12	15.12	15.18	15.21	16.75	16.80	17.05	18.00	19.00		Common Shs Outst'g C	22.00
	8.8	10.6	13.4	12.8	11.6	12.6	14.5	15.5	17.1	15.9	16.7	18.3	31.9	23.2	21.9	27.7	Bold figures are Value Line estimates			Avg Ann'l P/E Ratio	21.0
	.56	.64	.79	.84	.78	.79	.84	.81	.97	1.03	.86	1.00	1.82	1.23	1.17	1.47				Relative P/E Ratio	1.40
	7.0%	6.3%	5.3%	6.6%	6.7%	5.8%	5.5%	5.0%	4.2%	4.2%	3.9%	3.6%	3.5%	3.6%	3.1%	2.4%				Avg Ann'l Div'd Yield	2.5%
							153.8	148.1	173.4	184.0	197.5	209.2	212.7	228.0	236.2	268.6	280	300		Revenues ($mill)	380
							14.1	14.6	16.1	16.0	20.4	20.3	11.9	16.5	22.5	23.1	28.0	32.0		Net Profit ($mill)	45.0
							41.1%	40.9%	46.0%	45.7%	43.0%	38.9%	43.5%	37.4%	47.0%	40.5%	41.0%	41.0%		Income Tax Rate	42.0%
							--	--	--	--	--	--	--	--	--	--	Nil	Nil		AFUDC % to Net Profit	Nil
							43.0%	43.6%	51.0%	47.5%	54.9%	52.0%	52.0%	47.7%	50.4%	48.6%	49.5%	49.0%		Long-Term Debt Ratio	49.5%
							56.3%	55.7%	48.4%	51.9%	44.7%	48.0%	48.0%	52.3%	49.6%	51.4%	50.5%	51.0%		Common Equity Ratio	50.5%
							268.4	277.1	328.2	371.1	447.6	444.4	442.3	480.4	532.5	551.6	635	720		Total Capital ($mill)	965
							383.6	414.8	449.6	509.1	539.8	563.3	602.3	664.2	713.2	750.6	795	835		Net Plant ($mill)	975
							6.9%	7.0%	6.6%	6.4%	6.1%	6.5%	4.6%	5.2%	5.4%	6.0%	6.0%	6.0%		Return on Total Cap'l	6.5%
							9.2%	9.4%	10.0%	9.2%	10.1%	9.5%	5.6%	6.6%	8.5%	8.1%	8.5%	9.0%		Return on Shr. Equity	9.0%
							9.2%	9.4%	10.1%	9.3%	10.1%	9.5%	5.6%	6.6%	8.5%	8.1%	8.5%	9.0%		Return on Com Equity	9.0%
							1.8%	2.1%	2.9%	3.0%	3.6%	3.3%	NMF	1.0%	2.8%	2.7%	3.5%	3.5%		Retained to Com Eq	4.5%
							80%	76%	72%	68%	65%	65%	113%	84%	67%	67%	60%	58%		All Div'ds to Net Prof	52%

% TOT. RETURN 3/07

	THIS STOCK	VL ARITH. INDEX
1 yr.	1.1	9.9
3 yr.	65.7	42.9
5 yr.	82.6	75.8

Target Price Range 2010 | 2011 | 2012

CAPITAL STRUCTURE as of 12/31/06
Total Debt $300.4 mill. Due In 5 Yrs $3.3 mill.
LT Debt $267.8 mill LT Interest $24.0 mill
(LT interest earned: 3.1x; total interest coverage: 2.9x) (49% of Cap'l)

Leases, Uncapitalized: None
Pension Assets-12/05 $64.3 mill.
Oblig. $86.1 mill.
Pfd Stock None. Pfd Div'd None

Common Stock 17,049,137 shs.
MARKET CAP: $625 million (Small Cap)

CURRENT POSITION ($MILL.)	2004	2005	12/31/06
Cash Assets	4.3	13.0	3.2
Receivables	14.3	13.3	14.8
Inventory (Avg Cst)	1.5	1.4	1.6
Other	32.9	41.2	44.8
Current Assets	53.0	68.9	64.4
Accts Payable	18.2	19.7	24.0
Debt Due	45.9	27.6	32.6
Other	22.2	30.3	29.3
Current Liab.	86.3	77.6	85.9
Fix. Chg. Cov.	246%	325%	325%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '03-'05 to '10-'12
Revenues	3.0%	3.0%	3.0%
"Cash Flow"	3.0%	1.5%	5.5%
Earnings	--	-2.5%	9.0%
Dividends	1.0%	1.0%	3.0%
Book Value	4.0%	4.5%	6.0%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2004	46.7	59.3	69.0	53.0	228.0
2005	49.8	60.5	68.1	57.8	236.2
2006	60.6	62.1	73.6	66.3	268.6
2007	63.0	69.0	79.0	69.0	280
2008	67.0	75.0	85.0	73.0	300

Calendar	EARNINGS PER SHARE A Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2004	.08	.30	.52	.15	1.05
2005	.22	.34	.47	.29	1.32
2006	.35	.36	.32	.30	1.33
2007	.35	.40	.45	.35	1.55
2008	.37	.43	.48	.37	1.65

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2003	.221	.221	221	.221	.88
2004	221	.221	221	.225	89
2005	.225	.225	225	.225	90
2006	.225	.225	225	235	.91
2007	.235				

BUSINESS: American States Water Co. operates as a holding company. Through its principal subsidiary, Golden State Water Company, it supplies water to more than 250,000 customers in 75 communities in 10 counties. Service areas include the greater metropolitan areas of Los Angeles and Orange Counties. The company also provides electric utility services to nearly 23,250 customers in the city of Big Bear Lake and in areas of San Bernardino County. Acquired Chaparral City Water of Arizona (10/00). Has roughly 555 employees. Officers & directors own 3.1% of common stock (4/07 Proxy). Chairman: Lloyd Ross. President & CEO: Floyd Wicks. Incorporated: CA. Addr.: 630 East Foothill Boulevard, San Dimas, CA 91773. Tele.: 909-394-3600. Web: www.aswater.com

Regulatory improvements augur well for American States Water. The California Public Utilities Commission (CPUC) is responsible for overseeing utility companies and their business practices in the Golden State. After years of handing down unfavorable decisions in a delayed fashion, it appears as though the board has taken a turn for the better. Under Governor Schwarzenegger's watch, it has employed a much more business-friendly approach, issuing more favorable decisions in much shorter time. Also, the CPUC announced that it has eliminated its earnings test on balancing account cost recovery, enabling Cal-based water utilities to recover costs even if they were earning over their allowed ROE in the district. We view these developments as positives for AWR. It has a number of GRC cases being reviewed that may well add to our current earnings estimates of $1.55 for this year and $1.65 for 2008.

There may be even more good news on the horizon. A fellow Cal water utility provider filed a general rate case last year petitioning the CPUC to enact a water revenue adjustment mechanism (RAM). If enacted, RAM would allow recovery of refund water revenues when actual sales are below adopted water sales included in the GRC assumptions. The CPUC has asked the company to refile its request, sparking speculation that the commission may back such a practice. Although the adoption of this methodology would provide significant upside to our estimates, as per *Value Line* protocol, we will not account for such until a decision is finalized.

Government contracts provide further optimism. The military has expressed its interest in outsourcing water and wastewater operations at all of its bases. American has already inked deals for a couple of these bases, and additional deals could add upside to our 3- to 5-year projections.

Still, most investors will want to take a pass on this untimely issue. We are concerned that infrastructure costs will increase at too fast a rate over the next couple of years and offset any gains we envision from the aforementioned initiatives. Therefore, the stock holds limited 3- to 5-year appreciation potential.

Andre J. Costanza *April 27, 2007*

(A) Primary earnings. Excludes nonrecurring gains: '91, 73¢; '92, 13¢; '04, 14¢; '05, 25¢; '06, 6¢. Quarterly earnings may not sum due to change in share count. Next earnings report due early May.
(B) Dividends historically paid in early March, June, September, December. ■ Div'd reinvestment plan available.
(C) In millions, adjusted for splits.

Company's Financial Strength	B++
Stock's Price Stability	75
Price Growth Persistence	85
Earnings Predictability	60

AQUA AMERICA NYSE-WTR

RECENT PRICE 23.37 | P/E RATIO 29.6 (Trailing: 33.4 / Median: 23.0) | RELATIVE P/E RATIO 1.53 | DIV'D YLD 2.1% | VALUE LINE

TIMELINESS 4 Raised 3/9/07
SAFETY 3 Lowered 8/1/03
TECHNICAL 3 Lowered 12/22/06
BETA .90 (1.00 = Market)

2010-12 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	30	(+30%)	9%
Low	19	(-20%)	-2%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	0	0	0	0
Options	0	1	0	0	2	4	2	0	1
to Sell	0	1	0	0	2	3	2	0	1

Institutional Decisions

	2Q2006	3Q2006	4Q2006
to Buy	131	119	122
to Sell	105	84	91
Hld's(000)	40896	44837	51814

	High:	5.7	8.5	11.5	11.5	12.0	14.8	15.0	16.8	18.5	29.2	29.8	24.0
	Low:	3.9	4.4	7.2	7.6	6.3	9.4	9.6	11.8	14.2	17.5	20.1	20.5

LEGENDS
1.60 x Dividends p sh divided by Interest Rate
Relative Price Strength
3-for-2 split 7/96
4-for-3 split 1/98
5-for-4 split 12/00
5-for-4 split 12/01
5-for-4 split 12/03
4-for-3 split 12/05
Options: Yes
Shaded area indicates recession

Target Price Range 2010 | 2011 | 2012

% TOT. RETURN 3/07

	THIS STOCK	VL ARITH. INDEX
1 yr.	-17.7	9.9
3 yr.	46.2	42.9
5 yr.	77.1	75.8

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	© VALUE LINE PUB., INC.	10-12
2.14	1.82	1.70	1.82	1.84	1.86	2.02	2.09	2.41	2.46	2.70	2.85	2.97	3.48	3.85	4.03	*4.35*	*4.65*	Revenues per sh	*5.35*
.45	.39	.42	.42	.47	.50	.56	.61	.72	.76	.86	.94	.96	1.09	1.21	1.26	*1.40*	*1.50*	"Cash Flow" per sh	*1.80*
.25	.24	.24	.26	.29	.30	.34	.40	.42	.47	.51	.54	.57	.64	.71	.70	*.80*	*.90*	Earnings per sh A	*1.05*
.19	.20	.21	.21	.22	.23	.24	.26	.27	.28	.30	.32	.35	.37	.40	.44	*.48*	*.55*	Div'd Decl'd per sh B■	*.70*
.54	.60	.47	.46	.52	.45	.58	.82	.90	1.16	1.09	1.20	1.32	1.54	1.84	2.05	*2.10*	*2.15*	Cap'l Spending per sh	*2.30*
2.07	2.09	2.29	2.41	2.46	2.69	2.84	3.21	3.42	3.85	4.15	4.36	5.34	5.89	6.30	6.96	*7.15*	*7.45*	Book Value per sh	*9.30*
41.42	51.20	59.40	59.77	63.74	65.75	67.47	72.20	106.80	111.82	113.97	113.19	123.45	127.16	128.97	132.33	*134.00*	*136.00*	Common Shs Outst'g C	*140.00*
10.8	12.5	14.4	13.5	12.0	15.6	17.8	22.5	21.2	16.2	23.6	23.6	24.5	25.1	31.8	34.7	*Bold figures are*		Avg Ann'l P/E Ratio	*23.0*
.69	.76	.85	.89	.80	.98	1.03	1.17	1.21	1.18	1.21	1.29	1.40	1.33	1.69	1.88	*Value Line*		Relative P/E Ratio	*1.55*
7.2%	6.8%	5.9%	6.0%	6.2%	4.9%	3.9%	2.9%	3.0%	3.3%	2.5%	2.5%	2.5%	2.3%	1.8%	1.9%	*estimates*		Avg Ann'l Div'd Yield	*2.9%*
136.2	151.0	257.3	275.5	307.3	322.0	367.2	442.0	496.8	533.5	*580*	*630*	Revenues ($mill)	*750*
23.2	28.8	45.0	50.7	58.5	62.7	67.3	80.0	91.2	92.0	*105*	*120*	Net Profit ($mill)	*150*
40.6%	40.5%	38.4%	38.9%	39.3%	38.5%	39.3%	39.4%	38.4%	39.6%	*39.5%*	*39.0%*	Income Tax Rate	*39.0%*
--	--	--	--	--	--	--	--	2.9%	*2.0%*	*2.0%*	*2.0%*	AFUDC % to Net Profit	*2.0%*
54.4%	52.7%	52.9%	52.0%	52.2%	54.2%	51.4%	50.0%	52.0%	50.8%	*51.0%*	*52.0%*	Long-Term Debt Ratio	*51.0%*
44.8%	46.0%	46.7%	47.8%	47.7%	45.8%	48.6%	50.0%	48.0%	49.2%	*49.0%*	*48.0%*	Common Equity Ratio	*49.5%*
427.2	496.6	782.7	901.1	990.4	1076.2	1355.7	1497.3	1690.4	1873.3	*1970*	*2110*	Total Capital ($mill)	*2550*
534.5	609.8	1135.4	1251.4	1368.1	1490.8	1824.3	2069.8	2280.0	2506.0	*2700*	*2850*	Net Plant ($mill)	*3500*
7.4%	7.6%	7.6%	7.4%	7.8%	7.6%	6.4%	6.7%	6.9%	6.5%	*7.0%*	*7.0%*	Return on Total Cap'l	*7.5%*
11.9%	12.3%	12.2%	11.7%	12.3%	12.7%	10.2%	10.7%	11.2%	10.0%	*11.0%*	*11.5%*	Return on Shr. Equity	*11.5%*
12.0%	12.4%	12.3%	11.7%	12.4%	12.7%	10.2%	10.7%	11.2%	10.0%	*11.0%*	*11.5%*	Return on Com Equity	*11.5%*
3.6%	4.5%	4.3%	4.7%	5.1%	5.2%	4.2%	4.6%	4.9%	3.7%	*4.0%*	*4.5%*	Retained to Com Eq	*4.0%*
70%	64%	65%	60%	59%	59%	59%	57%	56%	63%	*63%*	*64%*	All Div'ds to Net Prof	*66%*

CAPITAL STRUCTURE as of 12/31/06
Total Debt $1102.1 mill. Due in 5 Yrs $143.3 mill
LT Debt $951.7 mill LT Interest $55.0 mill
(LT Interest earned: 3.6x; total interest coverage: 3.4x) (50% of Cap'l)

Pension Assets-12/06 $126.5 mill
Oblig. $178.3 mill

Pfd Stock None
Common Stock 132,325,690 shares

MARKET CAP: $3.1 billion (Mid Cap)

CURRENT POSITION ($MILL.)	2004	2005	12/31/06
Cash Assets	13.1	11.9	44.0
Receivables	64.5	62.7	72.1
Inventory (AvgCst)	6.9	7.8	10.2
Other	5.6	7.6	8.4
Current Assets	90.1	90.0	134.7
Accts Payable	23.5	55.5	49.4
Debt Due	135.3	163.1	150.4
Other	58.6	44.7	55.8
Current Liab	217.4	263.3	255.6
Fix. Chg. Cov.	364%	377%	360%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '03-'05 to '10-'12
Revenues	7.0%	8.0%	*6.5%*
"Cash Flow"	9.5%	9.5%	*7.5%*
Earnings	9.0%	8.5%	*7.5%*
Dividends	6.0%	8.5%	*9.5%*
Book Value	9.5%	11.0%	*7.0%*

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2004	99.8	106.5	120.3	115.4	442.0
2005	114.0	123.1	136.8	122.9	496.8
2006	118.0	131.7	147.0	136.8	533.5
2007	*130*	*150*	*160*	*140*	*580*
2008	*140*	*160*	*180*	*150*	*630*

Calendar	EARNINGS PER SHARE A Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2004	.13	.14	.20	.17	.64
2005	.15	.17	.22	.17	.71
2006	.13	.17	.21	.19	.70
2007	*.16*	*.22*	*.22*	*.20*	*.80*
2008	*.20*	*.24*	*.24*	*.22*	*.90*

Calendar	QUARTERLY DIVIDENDS PAID B■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2003	.084	.084	.084	.09	.34
2004	.09	.09	.09	.098	.37
2005	.098	.098	.098	.107	.40
2006	.107	.107	.115	.115	.44
2007	.115				

BUSINESS: Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately 2.8 million residents in Pennsylvania, Ohio, North Carolina, Illinois, Texas, New Jersey, Florida, Indiana, and five other states. Divested three of four non-water businesses in '91; telemarketing group in '93; and others. Acquired AquaSource, 7/03; Consumers Water, 4/99; and others. Water supply revenues '06: residential, 60%; commercial, 14%; industrial & other, 26%. Officers and directors own 1.2% of the common stock (4/06 Proxy). Chairman & Chief Executive Officer: Nicholas DeBenedictis. Incorporated: Pennsylvania Address: 762 West Lancaster Avenue, Bryn Mawr, Pennsylvania 19010. Telephone: 610-525-1400. Internet: www.aquaamerica.com.

Aqua America's results are starting to improve. After reporting weak profits for the first nine months of 2006, the company posted a 12% earnings advance in the final quarter of the year. Problems, such as higher production costs, increased short-term financing expense, poor weather, and delays in regulatory approvals, eased a bit during the quarter.

Increased rates should help lift results in the year ahead. Although one of the company's largest subsidiaries, Aqua Pennsylvania, received a substantial lift in rates in mid-2006, contributions from these adjustments should be more meaningful in 2007. In addition to the recent settlement of rate cases in Illinois and New Jersey, we expect Aqua America to receive further rate increases in 2007 and 2008.

The company will likely expand through acquisition. Aqua America completed about 28 acquisitions in 2006. The largest purchase, New York Water Services, which closed at the end of the year, helped expand the customer base considerably. More recently, the company agreed to buy Aquarian Water of Sea Cliff, Long Island. Although the acquisition strategy makes sense, it probably adds some risk. Acquired facilities can require expensive capital improvements to qualify for rate increases. Also, expenses, such as depreciation, can rise, before being fully offset by higher revenue.

We expect earnings to advance at about 6%-10% annually, on average, for the next few years. We are leaving our earnings estimate for 2007 unchanged, and are introducing an estimate of $0.90 per diluted share for 2008 at this time. The company should be able to improve efficiency at some of its recently purchased businesses. Results should also benefit from moderating chemical prices and energy utility costs.

These shares are ranked 4 (Below Average) for Timeliness. Further, our current projections indicate the issue offers little, if any, appreciation potential for the next 3 to 5 years. The dividend payout remains at about 63%, which is considerable. But the yield on this stock is not too attractive and thus offers limited downside price protection for investors.

Adam Rosner *April 27, 2007*

(A) Primary shares outstanding through '95; diluted thereafter. Excl. nonrec. gains (losses): '90, (38¢); '91, (34¢); '92, (38¢); '99, (11¢); '00, 2¢; '01, 2¢; '02, 5¢; '03, 4¢. Excl. gain from disc. operations: '96, 2¢. Next earnings report due early May. (B) Dividends historically paid in early March, June, Sept. & Dec. ■ Div'd. reinvestment plan available (5% discount). (C) In millions, adjusted for stock splits

Company's Financial Strength	B+
Stock's Price Stability	85
Price Growth Persistence	90
Earnings Predictability	100

CALIFORNIA WATER NYSE-CWT

RECENT PRICE 40.72 | P/E RATIO 25.9 (Trailing: 30.4 / Median: 19.0) | RELATIVE P/E RATIO 1.34 | DIV'D YLD 2.8% | VALUE LINE

TIMELINESS 5 Lowered 8/11/06
SAFETY 2 Lowered 8/11/95
TECHNICAL 3 Lowered 1/26/07
BETA .90 (1.00 = Market)

2010-12 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	50	(+25%)	8%
Low	40	(Nil)	2%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	0	0	0	0	0	0	0
Options	0	0	0	0	0	0	0	0	0
to Sell	0	0	0	0	0	0	0	0	0

Institutional Decisions

	2Q2006	3Q2006	4Q2006
to Buy	42	35	65
to Sell	39	37	26
Hld's(000)	5714	5853	8338

	High:	21.9	29.6	33.8	32.0	31.4	28.6	26.9	31.4	37.9	42.1	45.8	44.6			Target Price Range
	Low:	16.3	18.6	20.8	22.6	21.5	22.9	20.5	23.7	26.1	31.2	32.8	35.5			2010 / 2011 / 2012

LEGENDS
— 1.33 x Dividends p sh divided by Interest Rate
.... Relative Price Strength
2-for-1 split 1/98
Options: No
Shaded area indicates recession

Percent shares traded 4.5 / 3 / 1.5

% TOT. RETURN 3/07

	THIS STOCK	VL ARITH INDEX
1 yr.	-12.4	9.9
3 yr.	49.4	42.9
5 yr.	79.9	75.8

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	© VALUE LINE PUB., INC.	10-12
11.18	12.29	13.34	12.59	13.17	14.48	15.48	14.76	15.96	16.16	16.26	17.33	16.37	17.18	17.44	16.20	17.40	18.15	Revenues per sh	21.30
1.98	1.92	2.25	2.02	2.07	2.50	2.92	2.60	2.75	2.52	2.20	2.65	2.51	2.83	3.03	2.76	3.20	3.45	"Cash Flow" per sh	3.90
1.21	1.09	1.35	1.22	1.17	1.51	1.83	1.45	1.53	1.31	.94	1.25	1.21	1.46	1.47	1.34	1.60	1.75	Earnings per sh A	2.15
.90	.93	.96	.99	1.02	1.04	1.06	1.07	1.09	1.10	1.12	1.12	1.12	1.13	1.14	1.15	1.16	1.17	Div'd Decl'd per sh B ■	1.20
3.03	3.09	2.53	2.26	2.17	2.83	2.61	2.74	3.44	2.45	4.09	5.82	4.39	3.73	4.01	4.28	4.35	4.50	Cap'l Spending per sh	4.35
10.35	10.51	10.90	11.56	11.72	12.22	13.00	13.38	13.43	12.90	12.95	13.12	14.44	15.66	15.79	18.31	19.05	19.55	Book Value per sh C	21.30
11.36	11.36	11.38	12.49	12.54	12.62	12.62	12.62	12.94	15.15	15.18	15.18	16.93	18.37	18.39	20.66	21.00	21.50	Common Shs Outst'g D	23.00
11.2	14.1	13.6	14.1	13.7	11.9	12.5	17.8	17.8	19.6	27.1	19.8	22.1	20.1	24.9	29.5	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	21.0
.72	.86	.80	.92	.92	.75	.73	.93	1.01	1.27	1.39	1.08	1.26	1.06	1.33	1.57			Relative P/E Ratio	1.40
6.6%	6.1%	5.2%	5.8%	6.4%	5.8%	4.6%	4.2%	4.0%	4.3%	4.4%	4.5%	4.2%	3.9%	3.1%	3.4%			Avg Ann'l Div'd Yield	2.7%
						195.3	186.3	206.4	244.8	246.8	263.2	277.1	315.6	320.7	334.7	365	390	Revenues ($mill)	490
						23.3	18.4	19.9	20.0	14.4	19.1	19.4	26.0	27.2	25.6	35.0	40.0	Net Profit ($mill)	50.0
						37.4%	36.4%	37.9%	42.3%	39.4%	39.7%	39.9%	39.6%	42.4%	39.7%	41.0%	41.0%	Income Tax Rate	41.0%
						--	--	--	--	--	--	10.3%	3.2%	3.3%	--	Nil	Nil	AFUDC % to Net Profit	Nil
						45.4%	44.2%	46.9%	48.9%	50.3%	55.3%	50.2%	48.6%	48.3%	43.3%	44.5%	46.5%	Long-Term Debt Ratio	48.5%
						53.5%	54.7%	52.0%	50.2%	48.8%	44.0%	49.1%	50.8%	51.1%	56.2%	55.0%	53.0%	Common Equity Ratio	51.0%
						306.7	308.6	333.8	388.8	402.7	453.1	498.4	585.9	568.1	673.6	730	790	Total Capital ($mill)	965
						460.4	478.3	515.4	582.0	624.3	697.0	759.5	800.3	862.7	941.5	1000	1060	Net Plant ($mill)	1240
						9.4%	7.8%	7.8%	6.8%	5.3%	5.9%	5.6%	6.1%	6.3%	5.2%	6.5%	6.5%	Return on Total Cap'l	7.0%
						13.9%	10.7%	11.2%	10.0%	7.2%	9.4%	7.8%	8.9%	9.3%	6.7%	8.5%	9.5%	Return on Shr. Equity	10.0%
						14.1%	10.8%	11.4%	10.1%	7.2%	9.5%	7.9%	9.0%	9.3%	6.8%	8.5%	9.5%	Return on Com Equity	10.0%
						6.0%	2.8%	3.5%	1.8%	NMF	1.0%	.7%	2.1%	2.1%	5%	2.5%	3.5%	Retained to Com Eq	4.5%
						58%	74%	70%	82%	119%	90%	91%	77%	78%	93%	70%	63%	All Div'ds to Net Prof	55%

CAPITAL STRUCTURE as of 12/31/06
Total Debt $293.6 mill. Due in 5 Yrs $11.9 mill.
LT Debt $291.8 mill. LT Interest $22.5 mill.

(LT interest earned: 3.5x; total Int. cov.: 3.2x)

Pension Assets-12/06 $78.4 mill.
Oblig. $109.1 mill.
Pfd Stock $3.5 mill. Pfd Div'd $.15 mill.
139,000 shares, 4.4% cumulative ($25 par)

Common Stock 20,656,699 shs.
as of 3/6/07
MARKET CAP: $850 million (Small Cap)

CURRENT POSITION ($MILL.)	2004	2005	12/31/06
Cash Assets	18.8	9.5	60.3
Other	51.6	42.7	49.3
Current Assets	70.4	52.2	109.6
Accts Payable	19.8	36.1	33.1
Debt Due	1.1	1.1	1.8
Other	36.3	39.6	35.3
Current Liab.	57.2	76.8	70.2
Fix. Chg. Cov.	338%	361%	317%

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '03-'05 to '10-'12
Revenues	2.5%	1.5%	3.5%
"Cash Flow"	3.0%	1.5%	5.0%
Earnings	1.0%	-0.5%	6.5%
Dividends	1.5%	1.0%	1.0%
Book Value	3.0%	3.0%	5.0%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2004	60.2	88.9	97.1	69.4	315.6
2005	60.3	81.5	101.1	77.8	320.7
2006	65.2	81.1	107.8	80.6	334.7
2007	70.0	90.0	120	85.0	365
2008	75.0	97.0	128	90.0	390

Calendar	EARNINGS PER SHARE A E Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2004	.08	.59	.59	.20	1.46
2005	.03	.41	.71	.32	1.47
2006	.04	.31	.68	.31	1.34
2007	.08	.42	.76	.34	1.60
2008	.10	.45	.82	.38	1.75

Calendar	QUARTERLY DIVIDENDS PAID B ■ Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2003	.281	.281	.281	.281	1.12
2004	.283	.283	.283	.283	1.13
2005	.285	.285	.285	.285	1.14
2006	.2875	.2875	.2875	.2875	1.15
2007	.290				

BUSINESS: California Water Service Group provides regulated and nonregulated water service to over 2 million people (483,900 customers) in 83 communities in California, Washington, New Mexico, and Hawaii. Main service areas: San Francisco Bay area, Sacramento Valley, Salinas Valley, San Joaquin Valley & parts of Los Angeles. Acquired National Utility Company (5/04); Rio Grande Corp (11/00). Revenue breakdown, '06: residential, 70%; business, 18%; public authorities, 5%; industrial, 5%; other, 2%. '06 reported deprec. rate: 3.3%. Has roughly 870 employees. Chairman: Robert W. Foy. President & CEO: Peter C. Nelson. Inc.: Delaware. Address: 1720 North First Street, San Jose, California 95112-4598. Telephone: 408-367-8200. Internet: www.calwater.com.

California Water Service Group appears poised for a strong bottom-line rebound this year. Although the water utility provider had some trouble in 2006, we expect better weather conditions, especially in the first half of the year, to help it bounce back. Meanwhile, there are better regulatory practices in play now. The California Public Utilities Commission (CPUC), which is responsible for maintaining a balance between consumers and Cal-based utilities, recently awarded CWT an allowed ROE of 10.2% on its general rate case regarding 24 districts. The ruling was in line with what we expected and points to an improving regulatory environment in the state. This augurs well for the company's prospects, as it submits a general rate case to recover higher non-operational costs for eight of its districts every three years, and has a few cases currently being reviewed. Against this backdrop, we look for CWT to post share earnings of $1.60 this year, representing a 19% gain.

Further regulatory improvements should boost 2008 earnings. Given the CPUC's more business-friendly nature, there is a good chance that the board will enact some of the reformations proposed in the Water Action Plan that are on the table. A decision is expected in the second half of this year. We are introducing a 2008 share-net estimate of $1.75.

Capital constraints remain a problem, though. CWT is making heavy investments in its current systems. Indeed, capital expenditures have increased significantly in recent years and are likely to remain high for the foreseeable future. Unfortunately, it does not have enough cash on hand to foot the bill, making additional stock and debt offerings necessary.

Growth-minded investors will want to look elsewhere. The stock is ranked 5 (Lowest) for Timeliness and offers limited 3- to 5-year appreciation potential, given its financing problems.

That said, those looking for a steady stream of income may like what they see. Despite its capital constraints, CWT recently raised its annual dividend, marking the 40th consecutive year of increase. Although there are higher-yielding instruments out there, CWT's 2 (Above Average) Safety rank adds appeal.

Andre J. Costanza *April 27, 2007*

(A) Basic EPS. Excl. nonrecurring gain (loss): '00, (7¢); '01, 4¢; 02, 8¢. Next earnings report due early May.
(B) Dividends historically paid in mid-Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
(C) Incl. deferred charges. In '06: $69.5 mill., $3.36/sh.
(D) In millions, adjusted for split.
(E) May not total due to change in shares.

Company's Financial Strength	B++
Stock's Price Stability	80
Price Growth Persistence	80
Earnings Predictability	70

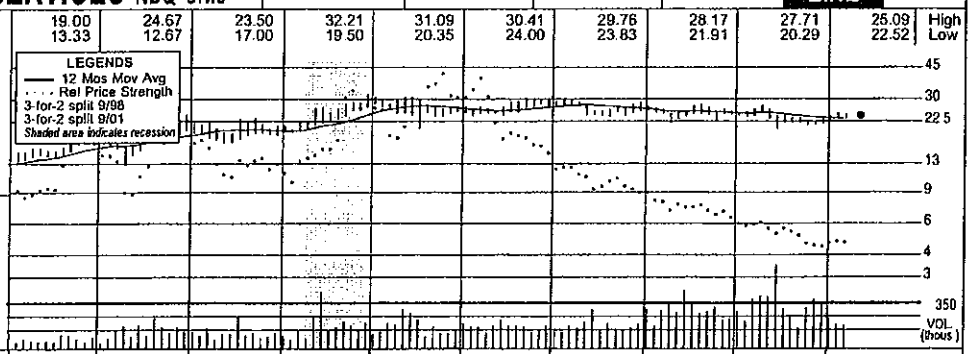
CONN. WATER SERVICES NDQ-CTWS

RECENT PRICE 24.25 | TRAILING P/E RATIO 29.9 | RELATIVE P/E RATIO 1.46 | DIV'D YLD 3.5% | VALUE LINE

RANKS

PERFORMANCE 2 Above Average
Technical 3 Average
SAFETY 3 Average
BETA .90 (1.00 = Market)

Financial Strength B+
Price Stability 75
Price Growth Persistence 55
Earnings Predictability 80



© VALUE LINE PUBLISHING, INC.	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007/2008
SALES PER SH	5.68	5.87	5.70	5.93	5.77	5.91	6.04	5.81	5.68	
"CASH FLOW" PER SH	1.59	1.65	1.73	1.78	1.78	1.89	1.91	1.62	1.52	
EARNINGS PER SH	1.02	1.03	1.09	1.13	1.12	1.15	1.16	.88	.81	1.05[A,B]/1.15[C]
DIV'DS DECL'D PER SH	.78	.79	.79	.80	.81	.83	.84	.85	.86	
CAP'L SPENDING PER SH	1.12	1.42	1.43	1.86	1.98	1.49	1.58	1.96	1.96	
BOOK VALUE PER SH	8.52	8.61	8.92	9.25	10.06	10.46	10.94	11.52	11.60	
COMMON SHS OUTST'G (MILL)	6.80	7.26	7.28	7.65	7.94	7.97	8.04	8.17	8.27	
AVG ANN'L P/E RATIO	15.5	18.2	18.2	21.5	24.3	23.5	22.9	28.6	29.1	23.1/21.1
RELATIVE P/E RATIO	.81	1.04	1.18	1.10	1.33	1.34	1.21	1.51	1.57	
AVG ANN'L DIV'D YIELD	4.9%	4.2%	4.0%	3.3%	3.0%	3.0%	3.1%	3.4%	3.6%	
SALES ($MILL)	37.9	42.6	41.5	45.4	45.8	47.1	48.5	47.5	46.9	Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.
OPERATING MARGIN	46.2%	48.7%	48.8%	56.1%	57.7%	52.1%	51.0%	48.3%	43.7%	
DEPRECIATION ($MILL)	3.9	4.5	4.7	5.0	5.4	5.9	6.0	6.1	5.9	
NET PROFIT ($MILL)	7.0	7.5	8.0	8.7	8.8	9.2	9.4	7.2	6.7	
INCOME TAX RATE	34.3%	40.1%	35.7%	36.1%	33.8%	17.9%	22.9%	--	23.5%	
NET PROFIT MARGIN	18.4%	17.6%	19.2%	19.1%	19.2%	19.5%	19.4%	15.1%	14.3%	
WORKING CAP'L ($MILL)	d3.7	d3.8	.3	d3.3	d5.1	d3.9	d.7	13.0	1.2	
LONG-TERM DEBT ($MILL)	62.5	65.4	64.7	64.0	64.8	64.8	66.4	77.4	77.3	
SHR. EQUITY ($MILL)	58.7	63.3	65.7	71.6	80.7	84.2	88.7	94.9	96.7	
RETURN ON TOTAL CAP'L	7.3%	7.4%	7.6%	7.9%	7.4%	7.5%	7.0%	5.0%	4.9%	
RETURN ON SHR. EQUITY	11.9%	11.8%	12.1%	12.1%	10.9%	10.9%	10.6%	7.5%	6.9%	
RETAINED TO COM EQ	2.8%	3.1%	3.2%	3.6%	3.1%	3.2%	3.1%	.3%	NMF	
ALL DIV'DS TO NET PROF	76%	74%	74%	71%	72%	71%	71%	95%	105%	

[A]No. of analysts changing earn. est. in last 14 days: 0 up, 0 down, consensus 5-year earnings growth 10.0% per year. [B]Based upon one analyst's estimate [C]Based upon one analyst's estimate.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	--	-2.5%
"Cash Flow"	-0.5%	-6.0%
Earnings	-2.5%	-5.0%
Dividends	1.0%	1.0%
Book Value	5.0%	0.5%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/04	10.9	12.0	13.9	11.7	48.5
12/31/05	10.9	11.0	14.1	11.5	47.5
12/31/06	10.5	11.4	13.3	11.7	46.9
12/31/07					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/03	.26	.15	.48	.26	1.15
12/31/04	.24	.26	.47	.19	1.16
12/31/05	.24	.15	.41	.08	.88
12/31/06	.21	.12	.45	.03	.81
12/31/07	.22	.23	.36		

Calendar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2004	.208	.208	.21	.21	.84
2005	.21	.21	.213	.213	.85
2006	.213	.213	.215	.215	.86
2007	.215				

INSTITUTIONAL DECISIONS

	2Q'06	3Q'06	4Q'06
to Buy	14	11	18
to Sell	18	19	12
Hld's(000)	1462	1253	1318

ASSETS ($mill.)	2004	2005	12/31/06
Cash Assets	.7	4.4	1.4
Receivables	9.8	5.9	9.5
Inventory (Avg cost)	.9	.9	.9
Other	3.9	14.9	2.4
Current Assets	15.3	26.1	14.2
Property, Plant & Equip. at cost	344.5	345.0	370.5
Accum Depreciation	98.4	97.3	102.4
Net Property	246.1	247.7	268.1
Other	29.5	32.2	32.9
Total Assets	290.9	306.0	315.2
LIABILITIES ($mill.)			
Accts Payable	5.5	4.8	6.0
Debt Due	6.0	7.1	5.3
Other	4.4	1.3	1.7
Current Liab	15.9	13.2	13.0

LONG-TERM DEBT AND EQUITY
as of 12/31/06

Total Debt $82.6 mill. Due in 5 Yrs. $5.3 mill.
LT Debt $77.3 mill.
Including Cap. Leases None
(44% of Cap'l)
Leases, Uncapitalized Annual rentals $.3 mill.

Pension Liability None in '06 vs. None in '05

Pfd Stock $.8 mill. Pfd Div'd Paid NMF

Common Stock 8,270,394 shares
(56% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Connecticut Water Services, Inc. primarily operates as a water utility company in Connecticut. It operates through three segments: Water Activities, Real Estate Transactions, and Services and Rentals. The Water Activities segment supplies public drinking water to its customers. The Real Estate Transactions segment is involved in the sale of its limited excess real estate holdings. The Services and Rentals segment provides contracted services to water and wastewater utilities and other clients, as well as leases certain of its properties to third parties. This segment's services include contract operations of water and wastewater facilities; Linebacker, its service line protection plan for public drinking water customers; and provision of bulk deliveries of emergency drinking water to businesses and residences via tanker truck. As of March 19, the company provided water to approximately 83,000 or 286,000 customers in 41 towns in Connecticut. Has about 200 employees. Chairman: Marshall T. Chiaraluce. Inc.: CT. Address: 93 West Main Street, Clinton, CT 06413. Tel.: (860) 669-8636. Internet: http://www.ctwater.com.

A.Z.

April 27, 2007

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 3/31/2007

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
6.66%	10.97%	-4.83%	-6.21%	3.39%

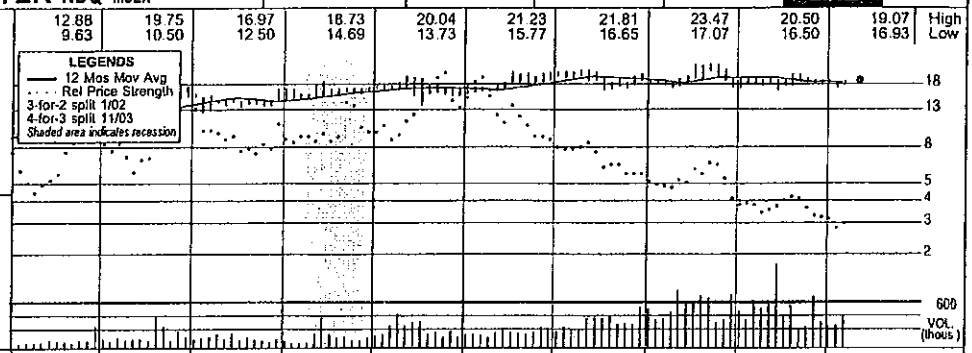
MIDDLESEX WATER NDQ--MSEX

RECENT PRICE 18.95 | TRAILING P/E RATIO 23.1 | RELATIVE P/E RATIO 1.13 | DIV'D YLD Nil | VALUE LINE

RANKS

PERFORMANCE 4 Below Average
Technical 3 Average
SAFETY 3 Average
BETA .85 (1.00 = Market)

Financial Strength B+
Price Stability 80
Price Growth Persistence 60
Earnings Predictability 70



© VALUE LINE PUBLISHING, INC.	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007/2008
SALES PER SH	4.39	5.35	5.39	5.87	5.98	6.12	6.25	6.44	6.16	
"CASH FLOW" PER SH	1.02	1.19	.99	1.18	1.20	1.15	1.28	1.33	1.33	
EARNINGS PER SH	.71	.76	.51	.66	.73	.61	.73	.71	.82	*.86 A,B/.88 C*
DIV'DS DECL'D PER SH	.58	.60	.61	.62	.63	.65	.66	.67	.68	
CAP'L SPENDING PER SH	2.68	2.33	1.32	1.25	1.59	1.87	2.54	2.18	2.31	
BOOK VALUE PER SH	6.80	6.95	6.98	7.11	7.39	7.60	8.38	8.60	9.82	
COMMON SHS OUTST'G (MILL)	9.82	10.00	10.11	10.17	10.36	10.48	11.36	11.58	13.17	
AVG ANN'L P/E RATIO	15.2	17.6	28.7	24.6	23.5	30.0	26.4	27.4	22.7	*22.0/21.5*
RELATIVE P/E RATIO	.79	1.00	1.87	1.26	1.28	1.71	1.39	1.45	1.23	
AVG ANN'L DIV'D YIELD	5.4%	4.4%	4.2%	3.8%	3.7%	3.5%	3.4%	3.5%	3.7%	
SALES ($MILL)	43.1	53.5	54.5	59.6	61.9	64.1	71.0	74.6	81.1	*Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.*
OPERATING MARGIN	37.0%	33.9%	32.2%	47.2%	47.1%	44.0%	44.4%	44.4%	47.4%	
DEPRECIATION ($MILL)	3.8	4.3	4.9	5.3	5.0	5.6	6.4	7.2	7.8	
NET PROFIT ($MILL)	6.5	7.9	5.3	7.0	7.8	6.6	8.4	8.5	10.0	
INCOME TAX RATE	31.5%	28.8%	33.1%	34.8%	33.3%	32.8%	31.1%	27.6%	33.4%	
NET PROFIT MARGIN	15.1%	14.7%	9.7%	11.7%	12.5%	10.3%	11.9%	11.4%	12.4%	
WORKING CAP'L ($MILL)	14.6	6.8	d2.7	d.9	d9.3	d13.3	d11.8	d4.5	2.8	
LONG-TERM DEBT ($MILL)	78.0	82.3	81.1	88.1	87.5	97.4	115.3	128.2	130.7	
SHR. EQUITY ($MILL)	71.7	74.6	74.7	76.4	80.6	83.7	99.2	103.6	133.3	
RETURN ON TOTAL CAP'L	5.7%	6.4%	4.9%	5.6%	6.0%	5.0%	5.1%	5.0%	5.1%	
RETURN ON SHR. EQUITY	9.1%	10.6%	7.1%	9.1%	9.6%	7.9%	8.5%	8.2%	7.5%	
RETAINED TO COM EQ	1.8%	2.5%	NMF	.5%	1.3%	NMF	.9%	.5%	1.2%	
ALL DIV'DS TO NET PROF	81%	78%	121%	94%	87%	106%	90%	94%	84%	

A No. of analysts changing earn. est. in last 14 days: 0 up, 0 down, consensus 5-year earnings growth 8.0% per year. B Based upon 2 analysts' estimates C Based upon one analyst's estimate

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	2.5%	-4.5%
"Cash Flow"	3.5%	0.5%
Earnings	3.5%	15.5%
Dividends	2.0%	1.5%
Book Value	5.0%	14.5%

Fiscal Year	QUARTERLY SALES ($mill.) 1Q	2Q	3Q	4Q	Full Year
12/31/04	15.9	17.8	19.8	17.5	71.0
12/31/05	16.7	18.4	20.8	18.7	74.6
12/31/06	18.2	21.0	22.6	19.3	81.1
12/31/07					

Fiscal Year	EARNINGS PER SHARE 1Q	2Q	3Q	4Q	Full Year
12/31/03	.11	.17	.22	.11	.61
12/31/04	.09	.16	.29	.19	.73
12/31/05	.12	.16	.26	.17	.71
12/31/06	.15	.25	.28	.14	.82
12/31/07	*.14*	*.24*	*.30*		

Calendar	QUARTERLY DIVIDENDS PAID 1Q	2Q	3Q	4Q	Full Year
2004	.165	.165	.165	.168	.66
2005	.168	.168	.168	.17	.67
2006	.17	.17	.17	.173	.68
2007	.173				

INSTITUTIONAL DECISIONS

	2Q'06	3Q'06	4Q'06
to Buy	15	17	21
to Sell	20	22	14
Hld's(000)	1771	1544	2182

ASSETS ($mill.)	2004	2005	12/31/06
Cash Assets	4.0	3.0	5.8
Receivables	9.9	11.8	12.6
Inventory (Avg cost)	1.2	1.3	1.3
Other	.9	.9	1.2
Current Assets	16.0	17.0	20.9
Property, Plant & Equip, at cost	314.9	343.0	376.8
Accum Depreciation	52.0	55.0	59.7
Net Property	262.9	288.0	317.1
Other	26.7	19.4	32.3
Total Assets	305.6	324.4	370.3
LIABILITIES ($mill.)			
Accts Payable	6.0	6.0	5.5
Debt Due	12.1	5.9	2.5
Other	9.7	9.6	10.1
Current Liab	27.8	21.5	18.1

LONG-TERM DEBT AND EQUITY
as of 12/31/06

Total Debt $133.2 mill. Due in 5 Yrs. $13.5 mill.
LT Debt $130.7 mill.
Including Cap. Leases None
(50% of Cap'l)

Leases, Uncapitalized Annual rentals None

Pension Liability $16.4 mill. in '06 vs. $6.7 mill. in '05

Pfd Stock $4.0 mill. Pfd Div'd Paid $.2 mill.
(1% of Cap'l)

Common Stock 13,168,081 shares
(49% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey and Delaware, as well as a regulated wastewater utility in New Jersey. It offers contract operations services and a service line maintenance program through its nonregulated subsidiary, Utility Service Affiliates, Inc. The company's water utility system treats, stores, and distributes water for residential, commercial, industrial, and fire prevention purposes. Under a special contract, it also provides water treatment and pumping services to the Township of East Brunswick. Middlesex Water's other New Jersey subsidiaries offer water and wastewater services to residents in Southampton Township. The company's Delaware subsidiaries, Tidewater Utilities, Inc.; Southern Shores Water Company, LLC; and Tidewater Environmental Services, Inc.; offer water services to retail customers in New Castle, Kent, and Sussex counties. Has 243 employees. Chairman: J. Richard Tompkins. Inc.: NJ. Address: 1500 Ronson Road, P.O. Box 1500, Iselin, NJ 08830. Tel.: (732) 634-1500. Internet: http://www.middlesexwater.com.

A.Z.

April 27, 2007

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 3/31/2007

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
-1.82%	-3.47%	-0.24%	-2.04%	24.04%

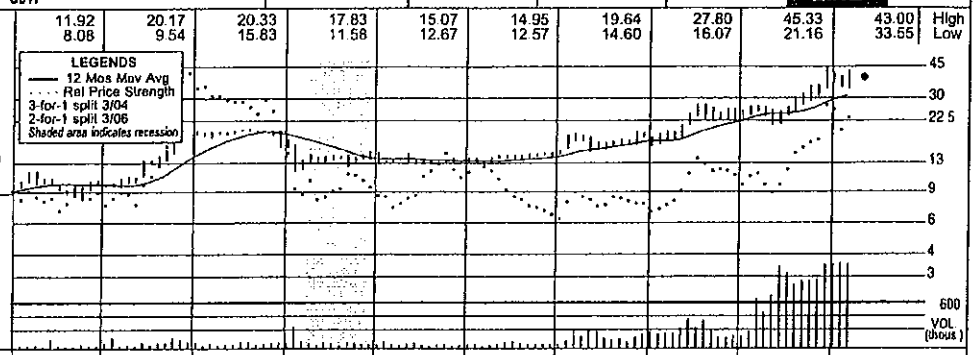
SJW CORP. NYSE-SJW

RECENT PRICE 39.26 | TRAILING P/E RATIO 33.0 | RELATIVE P/E RATIO 1.61 | DIV'D YLD 1.5% | VALUE LINE

RANKS

PERFORMANCE 3 Average
Technical 3 Average
SAFETY 3 Average
BETA .70 (1.00 = Market)

Financial Strength B++
Price Stability 75
Price Growth Persistence 80
Earnings Predictability 70



© VALUE LINE PUBLISHING, INC.	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007/2008
SALES PER SH	5.58	6.40	6.74	7.45	7.97	8.20	9.14	9.86	10.35	
"CASH FLOW" PER SH	1.26	1.43	1.23	1.49	1.55	1.75	1.89	2.21	2.38	
EARNINGS PER SH	.76	.87	.58	.77	.78	.91	.87	1.12	1.19	1.41 A,B/1.49 C
DIV'DS DECL'D PER SH	.39	.40	.41	.43	.46	.49	.51	.53	.57	
CAP'L SPENDING PER SH	1.81	1.77	1.89	2.63	2.06	3.41	2.31	2.83	3.87	
BOOK VALUE PER SH	7.53	7.88	7.90	8.17	8.40	9.11	10.11	10.72	12.48	
COMMON SHS OUTST'G (MILL)	19.01	18.27	18.27	18.27	18.27	18.27	18.27	18.27	18.28	
AVG ANN'L P/E RATIO	13.1	15.5	33.1	18.5	17.3	15.4	19.6	19.7	23.5	27.8/26.3
RELATIVE P/E RATIO	.68	.88	2.15	.95	.94	.88	1.04	1.04	1.27	
AVG ANN'L DIV'D YIELD	3.9%	3.0%	2.1%	3.0%	3.4%	3.5%	3.0%	2.4%	2.0%	
SALES ($MILL)	106.0	117.0	123.2	136.1	145.7	149.7	166.9	180.1	189.2	
OPERATING MARGIN	36.0%	33.2%	30.2%	64.4%	63.7%	56.0%	56.4%	55.9%	57.0%	
DEPRECIATION ($MILL)	9.6	10.2	11.9	13.2	14.0	15.2	18.5	19.7	21.3	
NET PROFIT ($MILL)	14.4	15.9	10.7	14.0	14.2	16.7	16.0	20.7	22.2	
INCOME TAX RATE	40.2%	35.9%	41.0%	34.5%	40.4%	36.2%	42.1%	41.6%	40.8%	
NET PROFIT MARGIN	13.6%	13.6%	8.7%	10.3%	9.8%	11.2%	9.6%	11.5%	11.7%	
WORKING CAP'L ($MILL)	9.4	d3.0	d11.4	d3.8	d4.9	12.0	13.0	10.8	22.2	
LONG-TERM DEBT ($MILL)	90.0	90.0	90.0	110.0	110.0	139.6	143.6	145.3	163.6	
SHR. EQUITY ($MILL)	143.2	143.9	144.3	149.4	153.5	166.4	184.7	195.9	228.2	
RETURN ON TOTAL CAP'L	7.4%	8.2%	5.9%	6.7%	6.9%	6.9%	6.5%	7.6%	7.0%	
RETURN ON SHR. EQUITY	10.1%	11.0%	7.4%	9.4%	9.3%	10.0%	8.7%	10.6%	9.7%	
RETAINED TO COM EQ	4.9%	5.9%	2.2%	4.1%	3.8%	4.7%	3.6%	5.6%	5.2%	
ALL DIV'DS TO NET PROF	52%	46%	70%	56%	59%	53%	58%	47%	46%	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

A No. of analysts changing earn est in last 14 days: 0 up, 0 down, consensus 5-year earnings growth 10.0% per year. B Based upon one analyst's estimate C Based upon one analyst's estimate.

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Sales	7.5%	5.0%
"Cash Flow"	9.5%	7.5%
Earnings	7.5%	6.0%
Dividends	5.5%	6.5%
Book Value	7.0%	16.5%

QUARTERLY SALES ($mill.)

Fiscal Year	1Q	2Q	3Q	4Q	Full Year
12/31/04	31.1	45.6	52.3	37.9	166.9
12/31/05	33.3	44.8	58.5	43.5	180.1
12/31/06	33.7	47.9	63.1	44.5	189.2
12/31/07					

EARNINGS PER SHARE

Fiscal Year	1Q	2Q	3Q	4Q	Full Year
12/31/03	.18	.24	.33	.16	.91
12/31/04	.09	.27	.30	.21	.87
12/31/05	.15	.31	.53	.13	1.12
12/31/06	.14	.35	.48	.22	1.19
12/31/07	.20	.37			

QUARTERLY DIVIDENDS PAID

Cal-endar	1Q	2Q	3Q	4Q	Full Year
2004	.128	.128	.128	.128	.51
2005	.134	.134	.134	.134	.54
2006	.141	.141	.141	.141	.56
2007	.151				

INSTITUTIONAL DECISIONS

	2Q'06	3Q'06	4Q'06
to Buy	31	34	33
to Sell	27	24	22
Hld's(000)	6941	7001	7341

ASSETS ($mill.)	2004	2005	12/31/06
Cash Assets	10.9	9.4	3.8
Receivables	14.6	18.4	20.9
Inventory	.6	.6	.9
Other	2.3	3.3	33.9
Current Assets	28.4	31.7	59.5
Property, Plant & Equip. at cost	646.9	695.0	776.2
Accum Depreciation	190.1	210.2	234.5
Net Property	456.8	484.8	541.7
Other	67.0	71.2	104.7
Total Assets	552.2	587.7	705.9
LIABILITIES ($mill.)			
Accts Payable	9	5.1	7.3
Debt Due	.3	.3	16.0
Other	14.2	15.5	13.9
Current Liab	15.4	20.9	37.2

LONG-TERM DEBT AND EQUITY
as of 12/31/06

Total Debt $179.6 mill. Due in 5 Yrs $21.7 mill.
LT Debt $163.6 mill.
Including Cap. Leases None
(42% of Cap'l)

Leases, Uncapitalized Annual rentals None

Pension Liability $26.3 mill. in '06 vs. $13.2 mill. in '05

Pfd Stock None Pfd Div'd Paid None

Common Stock 18,281,769 shares
(58% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: SJW Corp. operates as the holding company for San Jose Water Company (SJWC), SJW Land Company, Crystal Choice Water Service LLC, and SJWTX Water, Inc. SJWC produces, purchases, stores, purifies, distributes, and sells water. It provides water service to customers in Cupertino, San Jose, Campbell, Monte Sereno, Saratoga, the Town of Los Gatos, and in the county of Santa Clara, California. SJWC also provides nonregulated water-related services, including water system operations, billings, and cash remittance services. SJW Land owns and operates parking facilities in San Jose, California, as well as owns commercial buildings and other undeveloped land primarily in the San Jose Metropolitan area, some properties in the states of Florida, Texas, and Connecticut, and a 70% limited partnership interest in 444 West Santa Clara Street, L.P. Crystal Choice sells and rents water conditioning and purification equipment. Has 357 employees. Chairman: Drew Gibson. Inc.: CA. Address: 374 West Santa Clara Street, San Jose, CA 95113. Tel.: (408) 279-7800. Internet: http://www.sjwater.com.

A.Z.

April 27, 2007

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 3/31/2007

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
4.84%	36.48%	53.69%	151.41%	241.70%

SOUTHWEST WATER NDQ-SWWC

RECENT PRICE 14.24 | P/E RATIO 29.7 (Trailing: 35.6 / Median: 19.0) | RELATIVE P/E RATIO 1.53 | DIV'D YLD 1.7% | VALUE LINE

TIMELINESS 3 Raised 3/30/07
SAFETY 3 New 10/28/05
TECHNICAL 3 Lowered 2/16/07
BETA .90 (1.00 = Market)

2010-12 PROJECTIONS

	Price	Gain	Ann'l Total Return
High	18	(+25%)	8%
Low	12	(-15%)	-1%

Insider Decisions

	J	J	A	S	O	N	D	J	F
to Buy	0	0	1	0	0	0	0	0	0
Options	0	1	2	1	1	2	0	0	1
to Sell	1	1	3	1	2	2	1	1	1

Institutional Decisions

	2Q2006	3Q2006	4Q2006
to Buy	33	30	40
to Sell	32	20	16
Hld's(000)	8415	9034	10780

High:	3.7	5.0	5.6	9.2	8.3	10.2	12.4	11.2	14.3	15.2	19.1	15.3	
Low:	2.0	2.6	3.5	3.6	5.1	6.9	7.6	8.1	10.3	9.0	10.8	12.1	

LEGENDS
2.50 x Dividends p sh divided by Interest Rate
Relative Price Strength
6-for-5 split 12/96
5-for-4 split 10/98
3-for-2 split 10/99
5-for-4 split 1/01
4-for-3 split 1/04
Options: No
Shaded area indicates recession

Target Price Range 2010 | 2011 | 2012

% TOT. RETURN 3/07

	THIS STOCK	VL ARITH. INDEX
1 yr	-8.0	9.9
3 yr	16.2	42.9
5 yr	42.9	75.8

1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	©VALUE LINE PUB., INC.	10-12
3.34	3.77	4.03	4.20	4.84	5.31	5.61	5.63	6.16	7.49	8.15	9.12	10.70	9.23	9.10	9.42	9.60	10.00	Revenues per sh	11.00
.28	.44	.38	.38	.44	.46	.53	.59	.65	.76	.87	.86	.91	.67	.78	.85	.95	1.05	"Cash Flow" per sh	1.35
.02	.19	.08	.09	.12	.15	.21	.25	.31	.38	.42	.39	.44	.23	.34	.40	.45	.50	Earnings per sh [A]	.70
.18	.18	.14	.08	.08	.09	.09	.10	.11	.13	.14	.15	.16	.18	.20	.21	.24	.26	Div'd Decl'd per sh [B]	.34
.39	.42	.60	.72	.84	.95	.74	.79	.53	.55	1.06	1.78	1.14	1.26	1.66	1.87	1.90	1.95	Cap'l Spending per sh	2.05
2.41	2.42	2.31	2.31	2.45	2.40	2.52	2.70	3.05	3.44	3.84	4.27	4.90	6.17	6.49	6.98	7.60	8.45	Book Value per sh [D]	10.50
11.60	11.80	11.97	12.13	11.74	12.45	12.65	12.83	13.12	13.99	14.17	14.35	16.17	20.36	22.33	23.80	25.00	26.00	Common Shs Outst'g [C]	30.00
NMF	14.5	35.8	22.3	14.6	16.5	16.9	17.2	19.6	17.0	19.8	24.8	21.2	51.6	35.5	34.8	Bold figures are Value Line estimates		Avg Ann'l P/E Ratio	21.0
NMF	.88	2.11	1.46	.98	1.03	.97	.89	1.12	1.11	1.01	1.35	1.21	2.73	1.89	1.88			Relative P/E Ratio	1.40
5.5%	6.6%	4.7%	4.2%	4.7%	3.4%	2.7%	2.3%	1.8%	2.0%	1.7%	1.5%	1.7%	1.5%	1.6%	1.5%			Avg Ann'l Div'd Yield	2.3%
						71.0	72.2	80.9	104.7	115.5	130.8	173.0	188.0	203.2	224.2	240	260	Revenues ($mill)	330
						2.6	3.4	4.2	5.4	6.2	6.0	7.2	4.5	7.3	9.4	12.0	14.0	Net Profit ($mill)	22.0
						41.6%	39.5%	39.0%	37.0%	36.0%	34.9%	35.9%	35.1%	36.0%	35.0%	36.0%	36.0%	Income Tax Rate	35.5%
						--	--	--	--	14.4%	3.2%	--	11.0%	9.5%	12.5%	11.5%	12.0%	AFUDC % to Net Profit	12.5%
						47.9%	48.7%	45.2%	48.8%	51.4%	56.7%	47.9%	47.9%	44.7%	43.6%	44.0%	44.0%	Long-Term Debt Ratio	43.5%
						51.3%	50.5%	54.1%	50.7%	48.2%	42.9%	51.8%	52.0%	55.1%	56.4%	56.0%	56.0%	Common Equity Ratio	56.5%
						62.2	68.5	73.9	95.0	113.0	142.8	152.8	242.0	262.9	295.1	340	380	Total Capital ($mill)	560
						102.1	109.2	113.7	157.8	171.1	203.9	219.5	302.6	344.8	389.6	450	510	Net Plant ($mill)	750
						6.8%	7.1%	7.6%	7.6%	7.6%	5.8%	6.2%	3.1%	4.1%	4.6%	4.5%	5.0%	Return on Total Cap'l	5.0%
						8.0%	9.5%	10.3%	11.1%	11.4%	9.7%	9.0%	3.6%	5.0%	5.6%	6.0%	6.0%	Return on Shr. Equity	7.0%
						8.1%	9.6%	10.4%	11.1%	11.4%	9.7%	9.1%	3.6%	5.0%	5.6%	6.0%	6.0%	Return on Com Equity	7.0%
						4.5%	6.0%	7.0%	7.8%	7.8%	6.3%	5.8%	8%	2.1%	2.6%	3.0%	3.0%	Retained to Com Eq	3.5%
						45%	38%	33%	31%	32%	36%	36%	78%	58%	53%	51%	51%	All Div'ds to Net Prof	54%

CAPITAL STRUCTURE as of 12/31/06
Total Debt $130.0 mill. Due in 5 Yrs $41.0 mill
LT Debt $128.6 mill. LT Interest $8.0 mill
(Total interest coverage: 2.7x) (44% of Cap'l)

Leases, Uncapitalized: Annual rentals $6.7 mill.
Pension Liability None

Pfd Stock $.458 mill. Pfd Div'd $.024 mill.

Common Stock 23,802,000 shs

MARKET CAP: $350 million (Small Cap)

CURRENT POSITION ($MILL.)	2004	2005	12/31/06
Cash Assets	1.9	3.0	4.3
Receivables	23.9	26.5	27.5
Inventory (Avg Cst)	1.9	--	--
Other	17.6	18.2	16.5
Current Assets	45.3	47.7	48.3
Accts Payable	12.3	10.0	12.7
Debt Due	3.4	9.5	1.4
Other	20.0	21.1	21.7
Current Liab.	35.7	40.6	35.8

BUSINESS: Southwest Water Company provides a broad range of services including water production, treatment and distribution; wastewater collection and treatment; utility billing and collection; utility infrastructure construction management; and public works services. It operates out of two groups, Utility (38% of 2006 revenues) and Services (62%). Utility owns and manages rate-regulated public water utilities in California, New Mexico, Oklahoma, and Texas. Services does mostly maintenance work on a contract basis. Off. & dir. own 6.3% of com. shs.; Stein Roe Investment Council, 9.7% (4/07 proxy). CEO and Chairman: Mark Swatek. Inc.: DE. Addr.: One Wilshire Building, 624 S. Grand Ave. Ste. 2900, Los Angeles, CA 90017. Tel.: 213-929-1800. Internet: www.swwc.com

ANNUAL RATES of change (per sh)	Past 10 Yrs.	Past 5 Yrs.	Est'd '03-'05 to '10-'12
Revenues	8.5%	8.5%	2.0%
"Cash Flow"	7.0%	3.5%	8.0%
Earnings	13.5%	1.5%	11.0%
Dividends	6.0%	10.0%	9.5%
Book Value	9.5%	14.0%	8.5%

Calendar	QUARTERLY REVENUES ($ mill.) Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2004	39.8	45.7	55.0	47.5	188.0
2005	45.2	51.3	54.7	52.0	203.2
2006	50.8	55.4	60.1	57.9	224.2
2007	55.0	60.0	65.0	60.0	240
2008	62.0	66.0	68.0	64.0	260

Calendar	EARNINGS PER SHARE [A] Mar.31	Jun. 30	Sep. 30	Dec. 31	Full Year
2004	--	.13	.11	d.01	.23
2005	d.01	.15	.14	.06	.34
2006	.03	.08	.16	.13	.40
2007	.05	.14	.16	.10	.45
2008	.06	.15	.18	.11	.50

Calendar	QUARTERLY DIVIDENDS PAID [B] Mar.31	Jun.30	Sep.30	Dec.31	Full Year
2003	.042	.042	.042	.046	.17
2004	.046	.046	.046	.050	.19
2005	.048	.048	.048	.052	.20
2006	.052	.052	.052	.058	.21
2007	.058	.058			

Southwest Water Company is performing well. The Utility Group, which accounts for less than half of total revenues, continues to make sizable bottom-line contributions. Income from this unit advanced about 15% in 2006. Much of the strength was due to warmer temperatures and increased water consumption. Rates also rose, thanks to favorable regulatory environments in California and Texas. We expect the company to file for higher rates at several facilities in 2007, lifting this unit further.

The Services Group is improving as well. Revenue at this segment continues to benefit from the addition of new customers and expanded service offerings. Although the operating margin at this division has been a bit narrow in the past, profitability is starting to improve. This likely reflects better contract terms and lower levels of spending.

The company continues to make acquisitions. In March, Southwest Water announced that it had purchased five water companies and waste water facilities located in northern Mississippi. There are also some acquisitions in progress in Alabama. By purchasing businesses located outside of the California area, Southwest Water should be able to reduce its dependence on the state's regulatory agencies and weather climate. Contributions from upcoming acquisitions will not be included in our figures until these transactions are finalized.

We expect earnings to make steady, but moderate, advances for the next few years. We are leaving our earnings estimate unchanged for 2007, and introducing an estimate of $0.50 per diluted share for 2008. In addition to improved operations, results should benefit from restructuring efforts. Management plans to consolidate several subsidiaries in order to trim legal and accounting costs. Elsewhere, there will probably be a review of the employee compensation program.

These neutrally ranked shares have below-average appreciation potential for the next 3 to 5 years. The company raised its quarterly dividend by about 12% in the December period. However, the issue's dividend yield is still not too attractive, despite the considerable increase.

Adam Rosner *April 27, 2007*

(A) Diluted earnings. Excludes nonrecurring gains (losses): '00, (3¢); '01, (5¢); '02, 1¢; '05, (23¢). Next earnings report due early May.
(B) Dividends historically paid in late January, April, July, and October.
(C) In millions, adjusted for splits.
(D) Includes intangibles. In 2006: $36.0 million, $1.51/share.

Company's Financial Strength	B
Stock's Price Stability	60
Price Growth Persistence	75
Earnings Predictability	55

YORK WATER CO NDQ--YORW

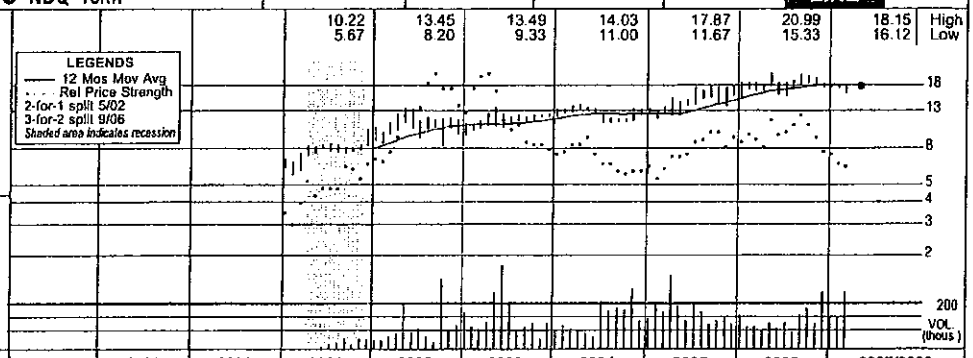
RECENT PRICE 17.82 | TRAILING P/E RATIO 30.7 | RELATIVE P/E RATIO 1.50 | DIV'D YLD 2.6% | VALUE LINE

RANKS

PERFORMANCE 3 Average
Technical 3 Average
SAFETY 3 Average
BETA .55 (1.00 = Market)

Financial Strength B+
Price Stability 60
Price Growth Persistence 50
Earnings Predictability 85

LEGENDS
12 Mos Mov Avg
Rel Price Strength
2-for-1 split 5/02
3-for-2 split 9/06
Shaded area indicates recession



© VALUE LINE PUBLISHING, INC.	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007/2008
REVENUES PER SH	--	--	--	2.05	2.05	2.17	2.18	2.58	2.56	
"CASH FLOW" PER SH	--	--	--	.59	.57	.65	.65	.79	.77	
EARNINGS PER SH	--	--	--	.43	.40	.47	.49	.56	.58	.63 A,B / .69 C
DIV'D DECL'D PER SH	--	--	--	.34	.35	.37	.39	.42	.45	
CAP'L SPENDING PER SH	--	--	--	.75	.66	1.07	2.50	1.69	1.85	
BOOK VALUE PER SH	--	--	--	3.79	3.90	4.06	4.65	4.85	5.84	
COMMON SHS OUTST'G (MILL)	--	--	--	9.46	9.55	9.63	10.33	10.40	11.20	
AVG ANN'L P/E RATIO	--	--	--	17.9	26.9	24.5	25.7	26.3	31.2	*28.3/25.8*
RELATIVE P/E RATIO	--	--	--	.92	1.47	1.40	1.36	1.39	1.68	
AVG ANN'L DIV'D YIELD	--	--	--	4.3%	3.3%	3.2%	3.1%	2.9%	2.5%	
REVENUES ($MILL)	--	--	18.5	19.4	19.6	20.9	22.5	26.8	28.7	
NET PROFIT ($MILL)	--	--	3.8	4.0	3.8	4.4	4.8	5.8	6.1	
INCOME TAX RATE	--	--	35.7%	35.8%	34.9%	34.8%	36.7%	36.7%	34.4%	
AFUDC % TO NET PROFIT	--	--	--	2.2%	3.7%	--	--	--	7.2%	
LONG-TERM DEBT RATIO	--	--	50.2%	47.7%	46.7%	43.4%	42.5%	44.1%	48.3%	
COMMON EQUITY RATIO	--	--	49.8%	52.3%	53.3%	56.6%	57.5%	55.9%	51.7%	
TOTAL CAPITAL ($MILL)	--	--	65.2	68.6	69.9	69.0	83.6	90.3	126.5	
NET PLANT ($MILL)	--	--	97.0	102.3	106.7	116.5	140.0	155.3	174.4	
RETURN ON TOTAL CAP'L	--	--	7.9%	7.9%	7.4%	8.5%	7.6%	8.4%	6.2%	
RETURN ON SHR. EQUITY	--	--	11.6%	11.2%	10.2%	11.4%	10.0%	11.6%	9.3%	
RETURN ON COM EQUITY	--	--	11.6%	11.2%	10.2%	11.4%	10.0%	11.6%	9.3%	
RETAINED TO COM EQ	--	--	2.5%	2.5%	1.3%	2.6%	2.1%	3.0%	2.2%	
ALL DIV'DS TO NET PROF	--	--	78%	78%	88%	77%	79%	74%	77%	

Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.

A No. of analysts changing earn. est. in last 14 days: 0 up, 0 down, consensus 5-year earnings growth 8.0% per year. B Based upon 3 analysts' estimates C Based upon 2 analysts' estimates

ANNUAL RATES

of change (per share)	5 Yrs.	1 Yr.
Revenues	3.5%	-0.5%
"Cash Flow"	4.5%	-2.5%
Earnings	4.5%	3.5%
Dividends	-3.0%	7.0%
Book Value	6.0%	20.5%

QUARTERLY SALES ($mill.)

Fiscal Year	1Q	2Q	3Q	4Q	Full Year
12/31/04	5.3	5.5	5.6	6.1	22.5
12/31/05	6.2	6.7	7.2	6.7	26.8
12/31/06	6.6	7.0	7.7	7.4	28.7
12/31/07					

EARNINGS PER SHARE

Fiscal Year	1Q	2Q	3Q	4Q	Full Year
12/31/03	.08	.11	.16	.12	.47
12/31/04	.12	.11	.12	.14	.49
12/31/05	.12	.14	.17	.13	.56
12/31/06	.12	.14	.17	.15	.58
12/31/07	*.13*	*.17*	*.20*		

QUARTERLY DIVIDENDS PAID

Calendar	1Q	2Q	3Q	4Q	Full Year
2004	.097	.097	.097	.097	.39
2005	.104	.104	.104	.104	.42
2006	.112	.112	.112	.112	.45
2007	.118	.118			

INSTITUTIONAL DECISIONS

	2Q'06	3Q'06	4Q'06
to Buy	9	11	13
to Sell	6	6	6
Hld's(000)	718	723	1164

ASSETS ($mill.)	2004	2005	12/31/06
Cash Assets	2	0	0
Receivables	3.7	3.8	4.8
Inventory (Avg cost)	7	8	8
Other	.4	.5	1.1
Current Assets	5.0	5.1	6.7
Property, Plant & Equip. at cost	164.3	182.4	202.7
Accum Depreciation	24.3	27.1	28.3
Net Property	140.0	155.3	174.4
Other	11.1	11.9	15.0
Total Assets	156.1	172.3	196.1
LIABILITIES ($mill.)			
Accts Payable	1.8	2.6	1.6
Debt Due	16.3	19.3	1.2
Other	3.1	2.8	3.1
Current Liab	21.2	24.7	5.9

LONG-TERM DEBT AND EQUITY
as of 12/31/06

Total Debt $52.3 mill. Due In 5 Yrs. $18.0 mill.
LT Debt $61.1 mill.
Including Cap. Leases $17.5 mill. (46% of Cap'l)
Leases, Uncapitalized Annual rentals None

Pension Liability $5.9 mill. in '06 vs. $3.9 mill. in '05

Pfd Stock None Pfd Div'd Paid None

Common Stock 11,201,119 shares (52% of Cap'l)

INDUSTRY: Water Utility

BUSINESS: York Water Company engages in the impounding, purification, and distribution of water in York County and Adams County, Pennsylvania. It supplies water for residential, commercial, industrial, and other customers. The company has two reservoirs, Lake Williams and Lake Redman, which together hold approximately 2.2 billion gallons of water. It also has a 15-mile pipeline from the Susquehanna River to Lake Redman that provides access to an additional supply of water. The company serves 34 municipalities in York County and four municipalities in Adams County. Has 106 employees. C.E.O. & President: Jeffrey S. Osman. Inc.: PA. Address: 130 East Market Street, York, PA 17401. Tel.: (717) 845-3601. Internet: http://www.yorkwater.com.

A.Z.

April 27, 2007

TOTAL SHAREHOLDER RETURN
Dividends plus appreciation as of 3/31/2007

3 Mos.	6 Mos.	1 Yr.	3 Yrs.	5 Yrs.
-4.26%	-9.41%	-0.65%	36.09%	91.55%

Stocks, Bonds, Bills, and Inflation

Market Results for 1926–2006

2007 Yearbook
Valuation Edition

MORNINGSTAR®

The Market Benchmark and Firm Size

Although not restricted to include only the 500 largest companies, the S&P 500 is considered a large company index. The returns of the S&P 500 are capitalization weighted, which means that the weight of each stock in the index, for a given month, is proportionate to its market capitalization (price times number of shares outstanding) at the beginning of that month. The larger companies in the index therefore receive the majority of the weight. The use of the NYSE "Deciles 1–2" series results in an even purer large company index. Yet many valuation professionals are faced with valuing small companies, which historically have had different risk and return characteristics than large companies. If using a large stock index to calculate the equity risk premium, an adjustment is usually needed to account for the different risk and return characteristics of small stocks. This will be discussed further in Chapter 7 on the size premium.

The Risk-Free Asset

The equity risk premium can be calculated for a variety of time horizons when given the choice of risk-free asset to be used in the calculation. The *Stocks, Bonds, Bills, and Inflation Yearbook* provides equity risk premia calculations for short-, intermediate-, and long-term horizons. The short-, intermediate-, and long-horizon equity risk premia are calculated using the income return from a 30-day Treasury bill, a 5-year Treasury bond, and a 20-year Treasury bond, respectively.

Although the equity risk premia of several horizons are available, the long-horizon equity risk premium is preferable for use in most business-valuation settings, even if an investor has a shorter time horizon. Companies are entities that generally have no defined life span; when determining a company's value, it is important to use a long-term discount rate because the life of the company is assumed to be infinite. For this reason, it is appropriate in most cases to use the long-horizon equity risk premium for business valuation.

20-Year versus 30-Year Treasuries

Our methodology for estimating the long-horizon equity risk premium makes use of the income return on a 20-year Treasury bond; however, the Treasury currently does not issue a 20-year bond. The 30-year bond that the Treasury recently began issuing again is theoretically more correct due to the long-term nature of business valuation, yet Ibbotson Associates instead creates a series of returns using bonds on the market with approximately 20 years to maturity. The reason for the use of a 20-year maturity bond is that 30-year Treasury securities have only been issued over the relatively recent past, starting in February of 1977, and were not issued at all through the early 2000s.

The same reason exists for why we do not use the 10-year Treasury bond; that is, a long enough history of market data is not available for 10-year bonds. We have persisted in using a 20-year bond to keep the basis of the time series consistent.

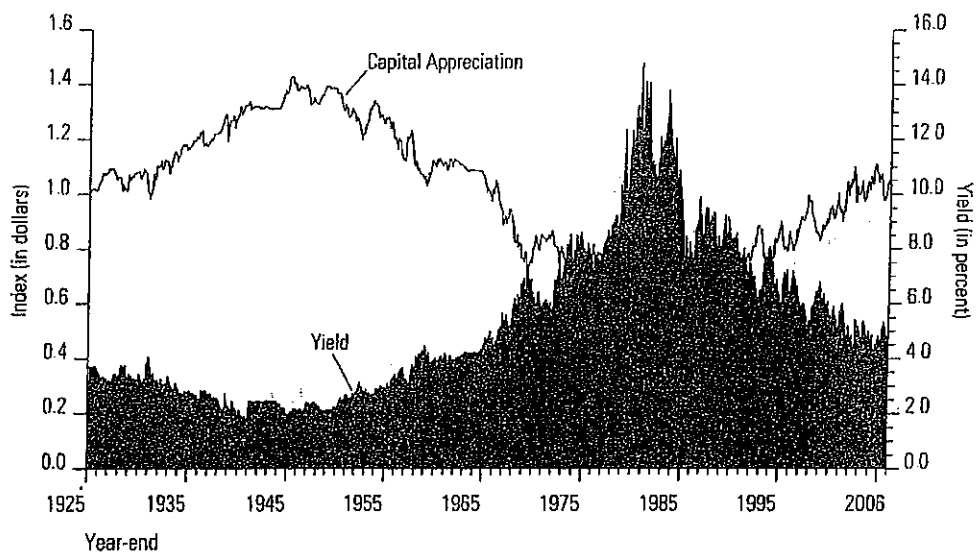
Income Return

Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results

from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return.[2]

Yields have generally risen on the long-term bond over the 1926–2006 period, so it has experienced negative capital appreciation over much of this time. This trend has turned around since the 1980s, however. Graph 5-2 illustrates the yields on the long-term government bond series compared to an index of the long-term government bond capital appreciation. In general, as yields rose, the capital appreciation index fell, and vice versa. Had an investor held the long-term bond to maturity, he would have realized the yield on the bond as the total return. However, in a constant maturity portfolio, such as those used to measure bond returns in this publication, bonds are sold before maturity (at a capital loss if the market yield has risen since the time of purchase). This negative return is associated with the risk of unanticipated yield changes.

Graph 5-2
Long-term Government Bond Yields versus Capital Appreciation Index
1925–2006



2 Please note that the appropriate forward-looking measure of the riskless rate is the yield to maturity on the appropriate-horizon government bond. This differs from the riskless rate used to measure the realized equity risk premium historically. Chapter 4 includes a thorough discussion of riskless rate selection in this context.

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Roger A. Morin, PhD

2006
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Vienna, Virginia

Chapter 6
Alternative Asset Pricing Models

6.1 Empirical Validity of the CAPM

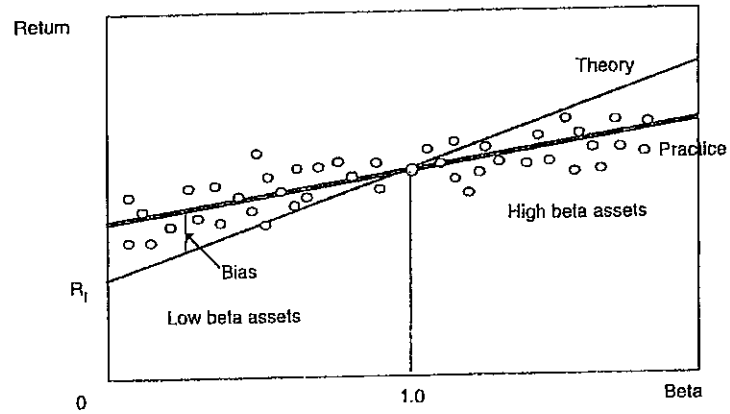
The last chapter showed that the practical difficulties of implementing the CAPM approach are surmountable. Conceptual and empirical problems remain, however.

At the conceptual level, the CAPM has been submitted to criticisms by academicians and practitioners. Contrary to the core assumption of the CAPM, investors may choose not to diversify, and bear company-specific risk if abnormal returns are expected. A substantial percentage of individual investors are indeed inadequately diversified. Short selling is somewhat restricted, in violation of CAPM assumptions. Factors other than market risk (beta) may also influence investor behavior, such as taxation, firm size, and restrictions on borrowing.

At the empirical level, there have been countless tests of the CAPM to determine to what extent security returns and betas are related in the manner predicted by the CAPM. The results of the tests support the idea that beta is related to security returns, that the risk-return tradeoff is positive, and that the relationship is linear. The contradictory finding is that the risk-return tradeoff is not as steeply sloped as predicted by the CAPM. With few exceptions, the empirical studies agree that the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM. That is, low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. This is shown pictorially in Figure 6-1. A CAPM-based estimate of cost of capital underestimates the return required from low-beta securities and overstates the return required from high-beta securities, based on the empirical evidence. Brealey, Myers, and Allen (2006), among many others,[1] provide recent empirical evidence very similar to the relationship depicted in Figure 6-1. This is one of the most

[1] For a summary of the empirical evidence on the CAPM, see Jensen (1972) and Ross (1978). The major empirical tests of the CAPM were published by Friend and Blume (1975), Black, Jensen, and Scholes (1972), Miller and Scholes (1972), Blume and Friend (1973), Blume and Husic (1973), Fama and Macbeth (1972), Basu (1977), Reinganum (1981B), Litzenberger and Ramaswamy (1979), Banz (1981), Gibbons (1982), Stambaugh (1982), Shanken (1985), Black (1993), and Brealey, Myers, and Allen (2006). Evidence in the Canadian context is available in Morin (1980, 1981).

FIGURE 6-1
PREDICTED VS. OBSERVED CAPM RETURN ESTIMATES



well-known results in finance. This result is particularly pertinent for public utilities whose betas are typically less than 1.00. Based on the evidence, as shown in Figure 6-1, a CAPM-based estimate of the cost of capital underestimates the return required from such securities.

The empirical evidence also demonstrates that the SML is highly unstable over short periods and differs significantly from the long-run relationship. This evidence underscores the potential for error in cost of capital estimates that apply the CAPM using historical data over short time periods. The evidence[2] also shows that the addition of specific company risk, as measured by standard deviation, adds explanatory power to the risk-return relationship.

In short, the currently available empirical evidence indicates that the simple version of the CAPM does not provide a perfectly accurate description of the process determining security returns. Explanations for this shortcoming include some or all of the following:

1. The CAPM excludes other important variables that are important in determining security returns, such as size, skewness, and taxes.
2. The market index used in the tests excludes important classes of securities, such as bonds, mortgages, and business investments. There is a further argument that the CAPM can never be really tested and that such a test is infeasible. This is because the market index proxy used

[2] See Friend, Westerfield, and Granito (1978) and Morin (1980).

in empirical tests of the CAPM is inadequate; since a true comprehensive market index is unavailable, such tests will be biased in the direction shown by the actual empirical results.[3] Moreover, the CAPM is a forward-looking expectational model and in order to test the model it is necessary to predict investor expectations correctly. Any empirical test of the CAPM is thus a test of the joint hypothesis of the model's validity and of the function used to generate expected returns from historical returns.

3. Constraints on investor borrowing exist contrary to the assumption of the CAPM.
4. Investors may value the hedging value of assets in protecting them against shifts in later investment opportunities. See Merton (1973) and Morin (1981).

Revised CAPM models have been proposed relaxing the above constraints, each model varying in complexity, each model attempting to inject more realism into the assumptions. Ross (1978), Tallman (1989), and more recently Guo (2004) present excellent surveys of the various asset pricing theories and related empirical evidence. These enhanced CAPMs produce broadly similar expressions for the relationship between risk and return and engender an SML that is flatter than the CAPM prediction, in line with the empirical evidence. Section 6.2 focuses on the more tractable extensions of the CAPM that possess some applicability to public utility regulation. Section 6.3 discusses the Empirical CAPM. Section 6.4 describes the Arbitrage Pricing Model, a viable alternative to the CAPM. Section 6.5 discusses the Fama-French Three-Factor Model of asset pricing. The Market-Derived Pricing Model is described in Section 6.6.

6.2 CAPM Extensions

Several attempts to enrich the CAPM's conceptual validity and to ameliorate its applicability have been advanced. One popular explanation of the CAPM's inability to explain security returns satisfactorily is that beta is insufficient and other systematic risk factors affect security returns. The implication is that the effects of these other independent variables should be quantified and used in estimating the cost of equity capital. The impact of the supplementary variables[4] can be expressed as an additive element to the standard CAPM equation as follows:

[3] See Roll (1977).

[4] The Arbitrage Pricing Model and the Fama-French three-factor asset pricing model, discussed in a later section, include factors other than the market that explain observed security returns.

The model is analogous to the standard CAPM, but with the return on a minimum risk portfolio that is unrelated to market returns, R_Z, replacing the risk-free rate, R_F. The model has been empirically tested by Black, Jensen, and Scholes (1972), who find a flatter than predicted SML, consistent with the model and other researchers' findings. An updated version of the Black-Jensen-Scholes study is available in Brealey, Myers, and Allen (2006) and reaches similar conclusions.

The zero-beta CAPM cannot be literally employed to estimate the cost of capital, since the zero-beta portfolio is a statistical construct difficult to replicate. Attempts to estimate the model are formally equivalent to estimating the constants, a and b, in Equation 6-2. A practical alternative is to employ the Empirical CAPM, to which we now turn.

6.3 Empirical CAPM

As discussed in the previous section, several finance scholars have developed refined and expanded versions of the standard CAPM by relaxing the constraints imposed on the CAPM, such as dividend yield, size, and skewness effects. These enhanced CAPMs typically produce a risk-return relationship that is flatter than the CAPM prediction in keeping with the actual observed risk-return relationship. The ECAPM makes use of these empirical findings. The ECAPM estimates the cost of capital with the equation:

$$K = R_F + \hat{\alpha} + \beta \times (MRP - \hat{\alpha}) \qquad (6\text{-}5)$$

where $\hat{\alpha}$ is the "alpha" of the risk-return line, a constant, and the other symbols are defined as before. All the potential vagaries of the CAPM are telescoped into the constant $\hat{\alpha}$, which must be estimated econometrically from market data. Table 6-2 summarizes[10] the empirical evidence on the magnitude of alpha.[11]

[10] The technique is formally applied by Litzenberger, Ramaswamy, and Sosin (1980) to public utilities in order to rectify the CAPM's basic shortcomings. Not only do they summarize the criticisms of the CAPM insofar as they affect public utilities, but they also describe the econometric intricacies involved and the methods of circumventing the statistical problems. Essentially, the average monthly returns over a lengthy time period on a large cross-section of securities grouped into portfolios are related to their corresponding betas by statistical regression techniques; that is, Equation 6-5 is estimated from market data. The utility's beta value is substituted into the equation to produce the cost of equity figure. Their own results demonstrate how the standard CAPM underestimates the cost of equity capital of public utilities because of utilities' high dividend yield and return skewness.

[11] Adapted from Vilbert (2004).

TABLE 6-2
EMPIRICAL EVIDENCE ON THE ALPHA FACTOR

Author	Range of alpha
Fischer (1993)	−3.6% to 3.6%
Fischer, Jensen and Scholes (1972)	−9.61% to 12.24%
Fama and McBeth (1972)	4.08% to 9.36%
Fama and French (1992)	10.08% to 13.56%
Litzenberger and Ramaswamy (1979)	5.32% to 8.17%
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 5.04%
Pettengill, Sundaram and Mathur (1995)	4.6%
Morin (1989)	2.0%

For an alpha in the range of 1%–2% and for reasonable values of the market risk premium and the risk-free rate, Equation 6-5 reduces to the following more pragmatic form:

$$K = R_F + 0.25\,(R_M - R_F) + 0.75\,\beta(R_M - R_F) \qquad (6\text{-}6)$$

Over reasonable values of the risk-free rate and the market risk premium, Equation 6-6 produces results that are indistinguishable from the ECAPM of Equation 6-5.[12]

An alpha range of 1%–2% is somewhat lower than that estimated empirically. The use of a lower value for alpha leads to a lower estimate of the cost of capital for low-beta stocks such as regulated utilities. This is because the use of a long-term risk-free rate rather than a short-term risk-free rate already incorporates some of the desired effect of using the ECAPM. That is, the

[12] Typical of the empirical evidence on the validity of the CAPM is a study by Morin (1989) who found that the relationship between the expected return on a security and beta over the period 1926–1984 was given by:

$$\text{Return} = 0.0829 + 0.0520\,\beta$$

Given that the risk-free rate over the estimation period was approximately 6% and that the market risk premium was 8% during the period of study, the intercept of the observed relationship between return and beta exceeds the risk-free rate by about 2%, or 1/4 of 8%, and that the slope of the relationship is close to 3/4 of 8%. Therefore, the empirical evidence suggests that the expected return on a security is related to its risk by the following approximation:

$$K = R_F + x(R_M - R_F) + (1 - x)\beta(R_M - R_F)$$

where x is a fraction to be determined empirically. The value of x that best explains the observed relationship Return = $0.0829 + 0.0520\,\beta$ is between 0.25 and 0.30. If x = 0.25, the equation becomes:

$$K = R_F + 0.25(R_M - R_F) + 0.75\beta(R_M - R_F)$$

long-term risk-free rate version of the CAPM has a higher intercept and a flatter slope than the short-term risk-free version which has been tested. Thus, it is reasonable to apply a conservative alpha adjustment. Moreover, the lowering of the tax burden on capital gains and dividend income enacted in 2002 may have decreased the required return for taxable investors, steepening the slope of the ECAPM risk-return trade-off and bring it closer to the CAPM predicted returns.[13]

To illustrate the application of the ECAPM, assume a risk-free rate of 5%, a market risk premium of 7%, and a beta of 0.80. The Empirical CAPM equation (6-6) above yields a cost of equity estimate of 11.0% as follows:

$$K = 5\% + 0.25\,(12\% - 5\%) + 0.75 \times 0.80\,(12\% - 5\%)$$
$$= 5.0\% + 1.8\% + 4.2\%$$
$$= 11.0\%$$

As an alternative to specifying alpha, see Example 6-1.

Some have argued that the use of the ECAPM is inconsistent with the use of adjusted betas, such as those supplied by Value Line and Bloomberg. This is because the reason for using the ECAPM is to allow for the tendency of betas to regress toward the mean value of 1.00 over time, and, since Value Line betas are already adjusted for such trend, an ECAPM analysis results in double-counting. This argument is erroneous. Fundamentally, the ECAPM is not an adjustment, increase or decrease, in beta. This is obvious from the fact that the expected return on high beta securities is actually lower than that produced by the CAPM estimate. The ECAPM is a formal recognition that the observed risk-return tradeoff is flatter than predicted by the CAPM based on myriad empirical evidence. The ECAPM and the use of adjusted betas comprised two separate features of asset pricing. Even if a company's beta is estimated accurately, the CAPM still understates the return for low-beta stocks. Even if the ECAPM is used, the return for low-beta securities is understated if the betas are understated. Referring back to Figure 6-1, the ECAPM is a return (vertical axis) adjustment and not a beta (horizontal axis) adjustment. Both adjustments are necessary. Moreover, recall from Chapter 3 that the use of adjusted betas compensates for interest rate sensitivity of utility stocks not captured by unadjusted betas.

[13] The lowering of the tax burden on capital gains and dividend income has no impact as far as non-taxable institutional investors (pension funds, 401K, and mutual funds) are concerned, and such investors engage in very large amounts of trading on security markets. It is quite plausible that taxable retail investors are relatively inactive traders and that large non-taxable investors have a substantial influence on capital markets.

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Portfolio Beta Coefficients

A portfolio consisting of low-beta securities will itself have a low beta, since the beta of any set of securities is a weighted average of the individual securities' betas:

$$b_p = \sum_{i=1}^{n} w_i b_i \qquad (6\text{-}5)$$

Here b_p is the beta of the portfolio, which reflects how volatile the portfolio is in relation to the market index; w_i is the fraction of the portfolio invested in the *i*th stock; and b_i is the beta coefficient of the *i*th stock.

If an investor holds a $100,000 portfolio consisting of $10,000 invested in each of 10 stocks, and if each stock has a beta of 0.8, then the portfolio will have $b_p = 0.8$. Thus, the portfolio is less risky than the market, and it should experience relatively narrow price swings and have small rate of return fluctuations.

Now suppose one of the existing stocks is sold and replaced by a stock with $b_i = 2.0$. This action will increase the riskiness of the portfolio from $b_{p1} = 0.8$ to $b_{p2} = 0.92$:

$$b_{p2} = \sum_{i=1}^{n} w_i b_i = 0.9(0.8) + 0.1(2.0) = 0.92$$

Had a stock with $b_i = 0.2$ been added, the portfolio beta would have declined from 0.8 to 0.74. Adding this stock would, therefore, reduce the riskiness of the portfolio.

The Relationship between Risk and Rates of Return

In the preceding section, we saw that under the CAPM framework, beta is the appropriate measure of a stock's relevant risk. Now we must specify the relationship between risk and return—if beta rises by some specific amount, by how much must the stock's expected return increase to compensate for the increase in risk? To begin, let us define the following terms:

$\hat{k}_i$ = expected rate of return on the *i*th stock

k_i = required rate of return on the *i*th stock. If $\hat{k}_i$ is less than k_i, then you would not purchase this stock, or you would sell it if you owned it.

R_F = riskless rate of return, generally measured by the rate of return on U S Treasury securities

b_i = beta coefficient of the *i*th stock

k_M = required rate of return on an average ($b = 1.0$) stock. k_M is also the required rate of return on a portfolio consisting of all stocks, or the market portfolio

$RP_M = (k_M - R_F)$ = market risk premium. It is the additional return over the riskless rate required to compensate investors for assuming an "average" amount of risk.

$RP_i = b_i(k_M - R_F)$ = risk premium on the *i*th stock. The stock's risk premium is less than, equal to, or greater than the premium on an average stock, depending on whether its beta is less than, equal to, or greater than 1.0. If $b_i = 1.0$, then $RP_i = RP_M$.

The market risk premium, RP_M, depends on the degree of aversion that investors, in the aggregate, have to risk.[11] Let us assume that at the current time Treasury bonds yield $R_F = 8\%$, and an average share of stock has a required return of $k_M = 12\%$. Therefore, the market risk premium is 4 percent:

$$RP_M = k_M - R_F = 12\% - 8\% = 4\%.$$

It follows that, if one stock were twice as risky as some other, its risk premium would be twice as high, and, conversely, if its risk were only half as high, its risk premium would be half as high. Further, we can measure a stock's relative riskiness by its beta coefficient. Therefore, if we know the market risk premium, RP_M, and the stock's beta coefficient, b_i, we can find its risk premium as the product $b_i(RP_M)$. For example, if $b_i = 0.5$ and $RP_M = 4\%$, then RP_i is 2 percent:

$$\text{Risk premium for Stock i} = RP_i = b_i(RP_M) = 0.5(4\%) = 2.0\%. \quad (6\text{-}6)$$

To summarize, given estimates of R_F, k_M, and b_i, we can find the required rate of return on Stock i:

$$k_i = R_F + b_i(k_M - R_F) = R_F + b_i(RP_M) \quad (6\text{-}7)$$
$$= 8\% + 0.5(12\% - 8\%) = 8\% + 0.5(4\%) = 10\%.$$

If some other stock, j, were more risky than Stock i and had $b_j = 2.0$, then its required rate of return would be 16 percent:

$$k_j = 8\% + 2.0(4\%) = 16\%.$$

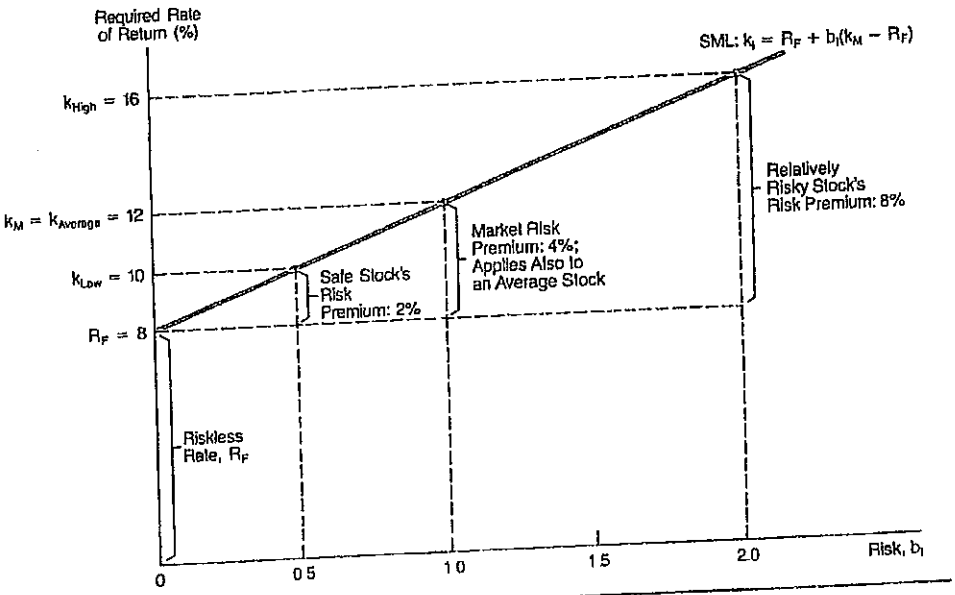
An average stock, with $b = 1.0$, would have a required return of 12 percent, the same as the market return:

$$k_{Average} = 8\% + 1.0(4\%) = 12\% = k_M.$$

Equation 6-7 is often expressed as a graph called the *Security Market Line (SML)*; Figure 6-9 shows the SML when $R_F = 8\%$ and $k_M = 12\%$. Note the following points:

[11] This concept is discussed in some detail in Appendix 6B. It should be noted that the risk premium of an average stock, $k_M - R_F$, cannot be measured with great precision because it is impossible to obtain precise values for k_M. However, empirical studies suggest that, where long-term U.S. Treasury bonds are used to measure R_F and where k_M is the expected return on the S&P 400 Industrial Stocks, the market risk premium varies somewhat from year to year, and it has generally ranged from 3 to 6 percent during the last 20 years.

Figure 6-9
The Security Market Line (SML)



1. Required rates of return are shown on the vertical axis, while risk as measured by beta is shown on the horizontal axis.
2. Riskless securities have $b_i = 0$; therefore, R_F appears as the vertical axis intercept.
3. The slope of the SML reflects the degree of risk aversion in the economy—the greater the average investor's aversion to risk, then (1) the steeper is the slope of the line, (2) the greater is the risk premium for any risky asset, and (3) the higher is the required rate of return on risky assets.[12] These points are discussed further in a later section.

[12]Students sometimes confuse beta with the slope of the SML. This is a mistake. As we saw earlier in connection with Figure 6-8, and as is developed further in Appendix 6A, beta does represent the slope of a line, but *not* the Security Market Line. This confusion arises partly because the SML equation is generally written, in this book and throughout the finance literature, as $k_i = R_F + b_i(k_M - R_F)$, and in this form b_i looks like the slope coefficient and $(k_M - R_F)$ the variable. It would perhaps be less confusing if the second term were written $(k_M - R_F)b_i$, but this is not generally done.

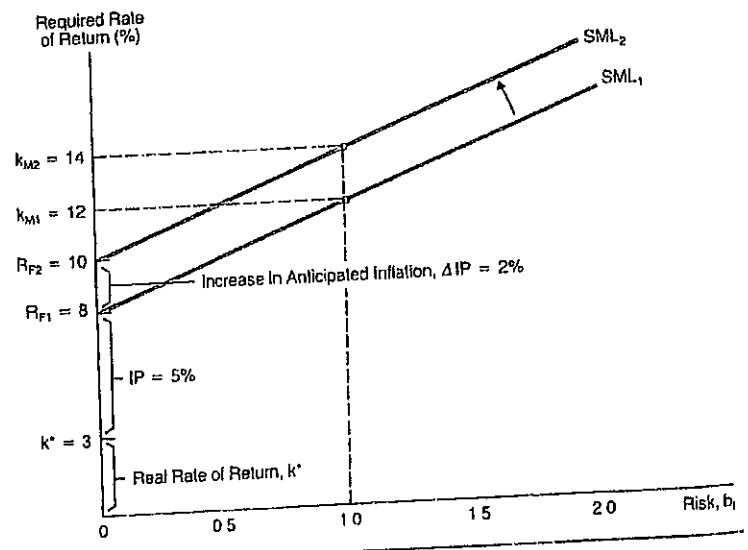
4. The values we worked out for stocks with $b_i = 0.5$, $b_i = 1.0$, and $b_i = 2.0$ agree with the values shown on the graph for k_{Low}, $k_{Average}$, and k_{High}.

The Security Market Line, and a company's position on the line, change over time as interest rates, investors' risk aversion, and individual companies' betas change. Such changes are discussed in the following sections.

The Impact of Inflation

As we saw in Chapter 3, interest amounts to "rent" on borrowed money, or the "price" of money. Thus, R_F is the price of money to a riskless borrower. The existing market risk-free rate is called the *nominal rate*, and it consists of two elements: (1) a *real*, or *inflation-free, rate of return*, k^*, and (2) an *inflation premium*, IP, equal to the anticipated rate of inflation. Thus, $R_F = k^* + IP$. The real rate on risk-free government securities has, historically, ranged from 2 to 4 percent, with a mean of about 3 percent. Thus, if no inflation were expected, risk-free government securities would tend to yield about 3 percent. However, as the expected rate of inflation increases, a premium must be added to the real rate of return to compensate investors for the loss of purchasing

Figure 6-10
Shift in the SML Caused by an Increase in Inflation



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EXAMPLE 4-1 *(cont.)*

(now Mergent) Public Utility Manual. To compute the annual stock return, the annual dividend yields reported on Moody's electric utility index are converted to annual dividends by multiplying the yield by the stock price for that year. The dividends are then added to the stock price appreciation for the year and the total is divided by the stock price. The bond price information is obtained by calculating the present value of a long-term Treasury bond due in 20 years with a $4.00 coupon and a yield to maturity equal to that particular year's U.S. Treasury bond yield. See example calculations below:

$$\text{2005 Stock Return} = \frac{(\text{2005 Stock Price} - \text{2004 Stock Price} + \text{2005 Dividend})}{\text{2004 Stock Price}}$$

$$\text{2005 Bond Return} = \frac{(\text{2005 Bond Price} - \text{2004 Bond Price} + \text{2005 Interest})}{\text{2004 Bond Price}}$$

Where interest = $4.00

The average risk premium over the period is 5.6% above long-term Treasury bonds. If the current long-term Treasury bond is 4.5%, the implied cost of equity for the average risk electric utility is therefore 5.0% + 5.6% = 10.6%. The same analysis can be replicated using the yield on A-rated utility bonds instead of the yield on long-term Treasury bonds.

4.4 Expected Risk Premium

Another approach to estimating the risk premium is to examine the returns *expected* from investments in common equities and bonds. The risk premium is simply the difference between the expected returns on stocks and bonds. This approach is prospective in nature in contrast to the realized risk premium approach described in the previous section, which is retrospective in nature. The methodology can be expressed as follows:

$$K_e = K_d + \text{expected risk premium}$$

where: K_e = cost of common equity
K_d = cost of debt

For example, if the current cost of debt is 5% and the expected risk premium between stocks and bonds is 7%, then the cost of common equity equals 12%:

$$K_e = K_d + \text{expected risk premium}$$
$$= 5\% + 7\% = 12\%$$

To estimate the expected risk premium, the expected rate of return on equity for a broad sample of companies is computed with the DCF model for each of several time periods (months, or quarters, or years) and the yields on debt for the corresponding period are subtracted from these estimates.

Implementing the Expected Risk Premium Method

To implement the method, three issues must be resolved: 1) a representative selection of equity securities must be defined, 2) a method of computing returns selected, and 3) the risk premium adjusted for comparable risk. Each of those issues is discussed in turn.

Choice of Equity Securities. In order that the estimated risk premium be as stable as possible and be uncontaminated by the vagaries of a particular group of securities, the benchmark group of equity securities should be broadly representative and well diversified. There are several stock market indices on which comprehensive and easily accessible data are available. Value Line's Composite Market Index, Standard & Poor's 500 Index, and the Dow Jones Industrials Average are suitable proxies for the equity market portfolio. There are also several utility industry indices on which comprehensive and easily accessible data are available. Both Moody's and Standard & Poor's publish composite utility industry indices for the electric, natural gas distribution, natural gas transmission, and telecommunications industries.

Method of Computing Returns. In the case of bonds, the yield to maturity serves as a proxy for expected return, and is a suitable measure of the return expected by bondholders who anticipate holding the bond until maturity.[8] Yield to maturity data on government securities and utility bonds are widely available from published sources, including on-line Web sites, Bloomberg and bondsonline.com for example.

In the case of common stock, prospective returns derived from application of the DCF model to a stock market index or utility stock index can provide a reasonably precise estimate of expected return.

Risk Adjustments. The risk premium estimate derived from a composite market index must be adjusted for any risk differences between the equity market index employed in deriving the risk premium and a specified utility common stock. Several methods can be used to effect the proper risk adjustment.

[8] The yield to maturity of a bond is the return promised to the bondholder so long as the issuer meets all interest and principal obligations and the investor reinvests coupon income at a rate equal to the yield to maturity. See Homer and Leibowitz (1972) for a full discussion of bond return computations and of the pitfalls of yield to maturity as a valid return measure.

First, the beta risk measure for the subject utility or the beta of a group of equivalent risk companies can serve as an adjustment device. The market risk premium, RP_M, is multiplied by the beta of the utility, β_i, to find the utility's own risk premium, RP_i:

$$RP_i = \beta_i RP_M$$

and the beta-adjusted risk premium is added to the bond yield to arrive at the utility's own cost of equity capital. For example, if the risk premium on the average stock is 7% over the Treasury long-term bond yield, based on a broad-based index such as the S&P 500 or Value Line's Composite Market Index, and if the subject utility has a beta of 0.80, the adjusted risk premium is 7% × 0.80 = 5.6%. This method is essentially the Capital Asset Pricing Model approach discussed in Chapter 5.

A second risk adjustment approach is to scale the risk premium up or down based on a comparison of the utility's risk relative to that of the overall market. Any of the objective quantitative measures of risk described in Chapter 3 are adequate for this purpose. For example, the ratio of the utility's standard deviation of returns to the average standard deviation of the individual component stocks of the index can be computed and serve as a basis for relative risk adjustment. Alternately, in the case of non-publicly traded utility stocks, the utility's average deviation around trend of earnings per share or of book return on equity relative to that of the market index could serve as the basis for the risk adjustment. The scaling can also be performed judgmentally on the basis of qualitative risk measures, such as relative bond ratings, Standard & Poor's stock ratings, and Value Line's safety ratings.

Utility Industry Risk Premiums

Another way of tailoring the risk premium approach to a specific group of companies, such as regulated utilities, is to estimate a specialized risk premium for securities in a given industry, and then to base the risk premium for a specific company on the industry-wide risk premium. Both VanderWeide (2005) and McShane (2005) provide excellent examples of this approach. In Example 4-2 drawn from McShane (2005), a forward-looking risk premium is derived by using the DCF model to estimate expected utility returns over time.[9] The expected return on equity is estimated as the dividend yield on the stock plus the expected growth in dividends over the long term. Each "point in time" DCF estimate of equity return is then matched with a corresponding "point in time" bond yield. The difference between the two is an indicator of the required utility equity risk premium at that point in time. Example 4-2 illustrates the approach.

[9] The DCF model is discussed in detail in Chapters 8 and 9.