BEFORE THE

RHODE ISLAND PUBLIC UTILITY COMMISSION

PREPARED REBUTTAL TESTIMONY

OF

PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

CONCERNING

FAIR RATE OF RETURN

RE: UNITED WATER RHODE ISLAND, INC.

DOCKET NO. 4255

NOVEMBER 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, Mt. Laurel, New Jersey 08054.

**Q. ARE YOU THE SAME PAULINE M. AHERN WHO PREVIOUSLY SUBMITTED PREPARED DIRECT TESTIMONY IN THIS PROCEEDING?**

A. Yes, I am.

**Q. HAVE YOU PREPARED AN EXHIBIT WHICH SUPPORTS YOUR REBUTTAL TESTIMONY?**

A. Yes, I have. It has been marked for identification as Exhibit No. __ and consists of Schedules PMA-1 Rebuttal through PMA-__ Rebuttal. Hereinafter, references to Schedules within this testimony will be from this Exhibit, unless otherwise noted.

## II. PURPOSE

**Q. WHAT IS THE PURPOSE OF THIS TESTIMONY?**

A. The purpose of this testimony is to rebut certain aspects of the direct testimony of Matthew Kahal, witness for the Division of Public Utilities and Carriers (Division), concerning capital structure and overall rate of return. Specifically, I will address Mr. Kahal's inclusion of short-term debt in United Water Rhode Island, Inc.'s (UWRI or the Company) ratemaking capital structure; his inclusion of a negative $3.285 million balance of Other Comprehensive Income in UWRI's common equity balance; his use of a group of gas distribution companies as a proxy for a water utility company; his primary reliance upon the Discounted Cash Flow

Model (DCF); his application of the Capital Asset Pricing Model (CAPM); the inadequacy of his recommended common equity cost rate; and his failure to reflect the risk of UWRI's capital structure and small size in his common equity cost rate recommendation. I will also respond to Mr. Kahal's comments on my direct testimony. Finally, I will provide an updated overall rate of return recommendation.

**Q. HOW IS THE REST OF YOUR TESTIMONY ORGANIZED?**

A. Section III addresses Mr. Kahal's recommended capital structure ratios and long-term debt cost rate; Section IV addresses his proxy groups; Section V addresses his common equity cost rate recommendation; and, Section VI addresses his comments on my direct testimony.;

## III. Capital Structure and Long-Term Debt Cost Rate

**Q. PLEASE COMMENT ON MR. KAHAL'S INCLUSION OF SHORT-TERM DEBT IN UWRI'S RATEMAKING CAPITAL STRUCTURE.**

A. It is not appropriate to include short-term debt in UWRI's ratemaking capital structure for several reasons noted in the Company's response to Div. 3-8. First, short-term debt is primarily used by United Waterworks, Inc. (UWW or the Parent) to fund interim capital projects. Second, UWW also uses short-term debt to fund gaps in working capital. Third, short-term debt has only been used intermittently during the UWW's history.

**Q. PLEASE EXPLAIN.**

A. Interim capital projects and working capital gaps are by definition temporary by nature, and thus, so is short-term debt. Short-term debt is only outstanding

temporarily until long-term debt can be issued or equity infusions can be received or when the Parent receives an influx of cash, e.g., through an asset sale.

**Q. WHAT DOES THE MONTHLY VOLATILITY OF THE BALANCE OF SHORT-TERM DEBT SHOWN ON PAGE 2 OF SCHEDULE MIK-1 INDICATE?**

A. Yes. As shown on page 2 of Schedule MIK-1, the balance of short-term debt varies from a low of $6.339 million in August 2010 to a high of $55.5 million in December 2010. Large swings in the monthly short-term debt balances are an indication that short-term cannot be funding rate base on a continuous basis.

**Q. PLEASE COMMENT UPON MR. KAHAL'S INCLUSION OF OTHER COMPREHENSIVE INCOME OF A NEGATIVE $3.285 MILLION IN HIS COMMON EQUITY RATIO.**

A. Mr. Kahal provides no support or rationale for reversing the Company's removal of Other Comprehensive Income for ratemaking purposes. Mr. Kahal has ignored the relevant portion of the Company's response to Div. 5-5 which is provided as Schedule PMA-1 Rebuttal of Exhibit No. ___. He completely ignores the pertinent part of the response to Div. 5-5 where the Company explains that the negative $3.285 million was omitted because it does not relate to the results of the Company's operations, but it has to do with a difference between pension funding and actuarially determined pension expense (for a different operating subsidiary). In view of the Company's entire response to Div. 5-5, it was fully justified in omitting the negative $3.285 million from its equity balance.

**Q. DO YOU HAVE ANY OBJECTION TO THE EMBEDDED COST OF LONG-TERM DEBT OF 6.07% AS DESCRIBED BY MR. KAHAL AT PAGE 14, LINES**

**14-20?**

A. No, because the embedded cost of debt of 6.07% is a reflection of UWW's long-term debt cost rate at this time.

## IV. PROXY GROUPS

**Q. MR. KAHAL EMPLOYS A PROXY GROUP OF NATURAL GAS DISTRIBUTION COMPANIES IN ADDITION TO HIS WATER PROXY GROUP FOR HIS ROE ANALYSIS. ANY COMMENT?**

A. As stated at pages 7-18 of my direct testimony and shown on Schedules PMA-2 and PMA-3 of Exhibit No. ___, the water industry faces unique investment risks relative to the electric, combination electric and gas and natural gas industries. Using proxy groups comprised of natural gas or electric distribution companies for an ROE analysis for a water company, like UWRI, cannot reflect specific water industry risk, and are therefore inadequate for cost of capital purposes.

**Q. ON PAGE 21, LINES 19-22, MR. KAHAL STATES THAT THE REASON FOR INCLUDING THE NATURAL GAS DISTRIBUTION COMPANIES IS BECAUSE "…THE AVAILABLE INFORMATION FOR THE FOUR SMALL COMPANIES ARE QUITE LIMITED…" PLEASE COMMENT.**

A. Mr. Kahal's water proxy group encompasses all of the publically-traded water utility companies in the United States (excluding Pennichuck Corporation, which is currently involved with merging into the city of Nashua). As is clear from my direct testimony and accompany exhibit, the universe of all publically-traded domestic water utilities provides all of the information necessary to derive an investor required return rate. There is no need to confuse the analysis by

including an additional proxy group which does not reflect the specific risks the water industry faces.

**Q. ON PAGE 21, LINE 24 THROUGH PAGE 22, LINE 2, MR. KAHAL STATES THAT "…IN THE RECENT PAST MS. AHERN ALSO HAS USED A GAS DISTRIBUTION UTILITY PROXY GROUP IN WATER RATE CASES, BUT SHE HAS CHOSEN NOT TO DO IN THIS CASE." PLEASE RESPOND.**

A. As shown in the Company's response to Div. 3-4, I have not employed a gas distribution utility proxy group in a water rate case since October 2010. Since the rate cases listed in response to Div. 3-4, I undertook a study of the relative risk between the various utility sectors, i.e., electric, combination electric and gas, natural gas and water. The conclusion of that study is stated at pages 15-18 of my direct testimony and supported by Schedule PMA-3 as discussed above.

**Q. WILL YOU BE ADDRESSING MR. KAHAL'S COST OF COMMON EQUITY FOR HIS NATURAL GAS UTILITY PROXY GROUP?**

A. No. In view of the foregoing, I find it unnecessary to discuss the results pertaining to the gas proxy group because those results are not reflective of the unique risks of water utilities in general, nor of UWRI, specifically.

**Q. IN UPDATING YOUR RECOMMENDED COMMON EQUITY COST RATE, DID YOU UPDATE YOUR PROXY GROUP ACCORDING TO THE CRITERIA STATED AT PAGES 22 AND 23 OF YOUR DIRECT TESTIMONY?**

A. Yes. Since Value Line Investment Survey (Value Line) now publishes a Ratings & Report for Artesian Resources, Corp., including a beta, I have included it in the proxy group for my updated recommended common equity cost rate. Hence, Mr.

Kahal and I now have an identical water proxy group.

## V. Common Equity Cost Rate

**Q. PLEASE DISCUSS MR. KAHAL'S RECOMMENDED COMMON EQUITY COST RATE OF 9.50%.**

A. Mr. Kahal's recommended common equity cost rate of 9.50% is inadequate because such a cost rate is based primarily upon a DCF analysis which has the tendency to understate/overstate investors' true required return in the current market environment when applied to a book value capital structure/rate base when market-to-book ratios are higher/lower than unity.

### Discounted Cash Flow Model (DCF)

**Q. MR. KAHAL'S COMMON EQUITY COST RATE RECOMMENDATION OF 9.50% IS BASED PRIMARILY UPON A DISCOUNTED CASH FLOW (DCF) ANALYSIS, NOTWITHSTANDING HIS USE OF THE CAPM AS A CHECK. PLEASE COMMENT.**

A. The DCF model utilized by Mr. Kahal is market-based since market prices are employed in its application. Therefore, it is based upon the Efficient Market Hypothesis (EMH) which is the foundation of modern investment theory. The EMH was pioneered by Eugene F. Fama[1] in 1970. As discussed in my direct testimony at pages 23-25, an efficient market is one in which security prices reflect all relevant information all the time. This implies that prices adjust instantaneously to new information, thus reflecting the intrinsic fundamental

[1] Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work" (Journal of Finance, May 1970) 383-417.

economic value of a security.[2]

The three forms of the EMH are:

A. The “weak” form which asserts that all past market prices and data are fully reflected in securities prices, i.e., technical analysis cannot enable an investor to “outperform the market”.

B. The “semistrong” form which asserts that all publicly available information is fully reflected in securities prices, i.e., fundamental analysis cannot enable an investor to “outperform the market”.

C. The “strong” form which asserts that all information, both public and private, is fully reflected in securities prices, i.e., even insider information cannot enable an investor to “outperform the market”.

The “semistrong” form of the EMH is generally held to be true because the use of insider information often enables investors to “outperform the market” and earn excessive returns. The generally-accepted “semistrong” form of the EMH means that all perceived risks are taken into account by investors in the prices they pay for securities. Investors are aware of all publicly-available information, including bond ratings; discussions about companies by bond rating agencies and investment analysts; as well as the various cost of common equity methodologies (models) discussed in the financial literature. This means that no single common equity cost rate model should be relied upon in determining a cost rate of common equity and that the results of multiple cost of common equity models should be taken into account.

**Q. YOUR DIRECT TESTIMONY STATES THAT THE ACADEMIC LITERATURE PROVIDES SUBSTANTIAL SUPPORT FOR THE NEED TO RELY UPON**

[2] Eugene F. Brigham, Fundamentals of Financial Management, Fifth Edition (The Dryden Press, 1989) 225.

**MORE THAN ONE COST OF COMMON EQUITY MODEL IN ARRIVING AT A RECOMMENDED COMMON EQUITY COST RATE. PLEASE COMMENT.**

A. Yes, there is substantial support in the academic literature for the use of more than cost of common equity models in arriving at a recommended common equity cost rate. Two examples are cited below.

Roger A. Morin[3] states:

> No one individual method provides the necessary level of precision for determining a fair return, but each method provides useful evidence to facilitate the exercise of an informed judgment. Reliance on any single method or preset formula is inappropriate when dealing with investor expectations because of possible measurement difficulties and vagaries in individual companies' market data. (Morin, p. 428)
>
> * * *
>
> The financial literature supports the use of multiple methods. Professor Eugene Brigham, a widely respected scholar and finance academician, asserts:[1](footnote omitted)
>
> > Three methods typically are used: (1) the Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) method, and (3) the bond-yield-plus-risk-premium approach. These methods are not mutually exclusive – no method dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand.
>
> Another prominent finance scholar, Professor Stewart Myers, in an early pioneering article on regulatory finance, stated:[2](footnote omitted)
>
> > Use more than one model when you can. Because estimating the opportunity cost of capital is difficult, only a fool throws away useful information. That means you should not use any one

[3] Roger A. Morin, New Regulatory Finance, (Public Utilities Reports, Inc., 2006) 428-431.

model or measure mechanically and exclusively. Beta is helpful as one tool in a kit, to be used in parallel with DCF models or other techniques for interpreting capital market data.

Reliance on multiple tests recognizes that no single methodology produces a precise definitive estimate of the cost of equity. As stated in Bonbright, Danielsen, and Kamerschen (1988), '*no single or group test or technique is conclusive*.' Only a fool discards relevant evidence. (italics in original) (Morin, p. 430)

* * *

While it is certainly appropriate to use the DCF methodology to estimate the cost of equity, there is no proof that the DCF produces a more accurate estimate of the cost of equity than other methodologies. Sole reliance on the DCF model ignores the capital market evidence and financial theory formalized in the CAPM and other risk premium methods. The DCF model is one of many tools to be employed in conjunction with other methods to estimate the cost of equity. *It is not a superior methodology that supplants other financial theory and market evidence. The broad usage of the DCF methodology in regulatory proceedings in contrast to its virtual disappearance in academic textbooks does not make it superior to other methods. The same is true of the Risk Premium and CAPM methodologies.* (italics added) (Morin, p. 431)

In addition, Brigham and Daves[4] provide additional support. They state:

Three methods typically are used: (1) Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) method, and (3) the bond-yield-risk-premium approach. These methods are not mutually exclusive – no method dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company's cost of equity, we generally use all three methods and then choose among them on the basis of our confidence in the data used for each in the specific case at hand.

* * *

Recent surveys found that the CAPM approach is by far the most widely used method. Although most firms use more than one method, almost 74 percent of respondents in one survey, and 85

[4] Brigham and Daves, 322, 332-333

> percent in the other, used the CAPM.[12] (footnote omitted) This is in sharp contrast to a 1982 survey, which found that only 30 percent of respondents used the CAPM.[13] (footnote omitted) Approximately 16 percent now use the DCF approach, down from 31 percent in 1982. The bond-yield-plus-risk-premium is used primarily by companies that are not publicly traded.
>
> People experienced in estimating the cost of equity recognize that both careful analysis and sound judgment are required. It would be nice to pretend that judgment is unnecessary and to specify an easy, precise way of determining the exact cost of equity capital. Unfortunately, this is not possible –finance is in large part a matter of judgment, and we simply must fact that fact.

In view of the foregoing, it is clear that investors are aware of all of the models available for use in determining the common equity cost rate. Therefore, the assumption that, collectively, investors use them all is consistent with the EMH. Hence, Mr. Kahal's primary reliance upon the DCF model, notwithstanding his use of the CAPM as a check, is at odds with the very foundation, i.e., the EMH, upon which the DCF is predicated.

**Q. IS IT APPROPRIATE TO APPLY A 9.40% DCF-DERIVED COMMON EQUITY COST RATE TO THE BOOK VALUE OF COMMON EQUITY?**

A. No. A common equity cost rate of 9.40%, based upon the DCF model, will mathematically mis-specify the investors' required return rate when the market value of common stock differs significantly from its book value It does so because market prices reflect investors' assessments of long-range market price growth potential (consistent with the infinite 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 (EPS) or

dividends per share (DPS) and the like. Market value and book values are seldom at unity.

Under the DCF model, the rate of return investors require is related to the price paid for a security. Thus, market prices form the basis of investment decisions and investors' expected rates of return. In contrast, a regulated utility is limited to earning on its net book value (depreciated original cost) rate base. Market values can diverge from book values for a myriad of reasons including, but not limited to, EPS and DPS expectations, merger / acquisition expectations, interest rates, etc. Thus, when market values are grossly disparate from their book values, a market-based DCF cost rate applied to the book value of common equity will not reflect investors' expected common equity cost rate

The market-based DCF model will result in a total annual dollar return on book common equity equal to the total annual dollar return expected by investors only when market and book values are equal, a rare and unlikely situation.

Roger A. Morin[5] has stated in New Regulatory Finance, (2006):

> The third reason and perhaps most important for caution and skepticism is that application of the DCF model produces estimates of common equity cost that are consistent with investors' expected return only when stock price and book value are reasonably similar, that is when the M/B is close to unity. As shown below, application of the standard DCF model to utility stocks understates the investor's expected return when the market-to-book (M/B) ratio of a given stock exceeds unity. This was particularly relevant in the capital market environment of the 1990s and 2000s where utility stocks were trading at M/B ratios well above unity and have been for nearly two decades. The converse is also true, that is, the DCF model overstates that investor's return when the stock's M/B ratio is less than unity. The reason for the distortion is that the DCF market return is applied to a book value rate base by the regulator, that is, a utility's earnings are limited to earnings on a book value rate base.

[5] Morin 434.

Despite the recent turmoil in stock prices, utility stocks continue to trade at market-to-book ratios well above unity, as shown on page 2 of Schedule PMA-7 Rebuttal, i.e., the market-to-book ratios of the water utilities utilized by both Mr. Kahal and myself in this proceeding ranged from 128.6% to 254.1% on October 18, 2011.

**Q. CAN THE UNDERSTATEMENT OF THE 9.40% RATE OF RETURN ON THE MARKET BASED UPON MR. KAHAL'S DCF APPLICATION BE MATHEMATICALLY DEMONSTRATED?**

A. Yes. Mr. Kahal's recommended common equity cost rate is based upon a DCF cost rate of 9.40% based upon an average adjusted dividend yield for his proxy group of nine water distribution companies of 3.40% plus his implied estimate of growth of 6.00%. I have demonstrated the inadequacy of Mr. Kahal's DCF cost rate on Schedule PMA-2 Rebuttal, which demonstrates that there is no realistic opportunity to earn the market-based rate of return on book value. In this example, market price is 173.1% in excess of book value and the investor expects a total return rate of 9.40%, Mr. Kahal's DCF cost rate for the nine water companies. The 9.40% market-based cost rate implies an annual return of $2.182 consisting of $0.789 in dividends and $1.393 in growth (market-price appreciation). When the 9.40% return rate is applied to book value, $13.410, 57.8% of market value, an opportunity for a total annual return is just $1.261 on book value. With annual dividends of $0.789, there is an opportunity to earn only $0.472 in market-price appreciation, a mere 2.03% on market price in contrast to the 6.00% growth in market price expected by investors for the group. There is

no possible way to achieve the expected growth of $1.391 (6.00%) related to an average market price of $23.210 absent a huge cut in annual cash dividends, an unreasonable expectation since such an action by a board of directors is usually indicative of an extremely adverse financial condition. Of course, if the converse situation exists (market prices substantially below their book values), a market-based DCF cost rate applied to the book value of common equity would overstate the cost rate.

Therefore, common equity cost rate of 9.40%, and, hence, a recommended common equity cost rate of 9.50% based upon it, is inadequate for UWRI for the reasons stated above and will be shown below to not be corroborated by either a correction to his CAPM analysis or an update of my recommended cost of common equity.

**Capital Asset Pricing Model (CAPM)**

**Q. PLEASE COMMENT UPON MR. KAHAL'S CAPM ANALYSIS.**

A. Mr. Kahal's CAPM analysis is flawed in three respects. First, he did not use a projected yield for his risk-free rate. Second, he relies upon a range of risk premiums which are outdated and are not representative of expected returns in the market. Finally, he did not include an Empirical CAPM (ECAPM) analysis.

**Q. PLEASE COMMENT UPON MR. KAHAL'S USE OF THE AVERAGE YIELD ON 30-YEAR U.S. TREASURY BONDS OVER A RECENT SIX-MONTH PERIOD.**

A. Mr. Kahal's use of average yields on 30-year U.S. Treasury bonds over a recent six-month period (March-August 2011) ignores the fact that both the cost of capital and ratemaking are prospective, which Mr. Kahal, himself, implicitly

acknowledges when he states on page 25, line 2 of his direct testimony regarding his DCF analysis that “The DCF growth rate should be prospective.” The cost of capital, including the cost rate of common equity is expectational, in that it reflects investors’ expectations of future capital markets, including an expectation of interest rate levels, as well as risks. In addition, ratemaking is prospective in that the rates set in this proceeding will be in effect for a period of time in the future.

Mr. Kahal has also ignored the tenets of the EMH, discussed in detail above as well as in my direct testimony. As noted, the “semistrong” form of the EMH is generally held to be true where all perceived risks are taken into account by investors in the prices they pay for securities and investors are aware of all publicly-available information, including bond ratings, discussions about companies by bond rating agencies and investment analysts, as well as the many interest rate forecasts available. Investors are also aware of the accuracy of past forecasts, whether for earnings or dividends growth or for interest rates. Investors have no prior knowledge of the accuracy of any forecasts available at the time they make their investment decisions. The accuracy of any forecast only becomes known after some future period of time has elapsed. For example, the accuracy of the current Blue Chip Financial Forecasts (October 1, 2011) consensus forecast of the 30-Year U.S. Treasury Bond of 3.60% for the six quarters ending with the first quarter 2013 (as derived in Note 2 on page 2 of Schedule PMA-3 Rebuttal), cannot be known until the end of the first quarter 2013, more than one year into the future. Therefore, consistent with the EMH

upon which the cost of common equity models utilized by Mr. Kahal and myself are predicated, and since investors have such interest rate projections available to them and are aware of the accuracy of such projections, interest rate projections should be utilized in a cost of common equity analysis.

**Q. PLEASE COMMENT UPON MR. KAHAL'S ESTIMATION OF THE MARKET EQUITY RISK PREMIUM COMPONENT OF HIS CAPM ANALYSIS.**

A. Mr. Kahal used the broad range of market equity risk premiums of 5% to 8% as presented in Brealey, Myers and Allen's Principles of Corporate Finance (2006). That range of premiums is stale, not supported by empirical evidence, and not representative of expected market equity risk premiums. As discussed above, both the cost of capital and ratemaking are prospective in nature. In addition, the underlying theory of the CAPM requires the use of an expected market return. Therefore, the use of an outdated opinion in a textbook is inconsistent with the prospective nature of both the cost of capital and ratemaking as well as with CAPM theory. Moreover, in estimating the total return on the market, Mr. Kahal did not even consider forecasted market returns, inconsistent with his recognition of the need to use expected growth rates in the application of the DCF.

**Q. HOW COULD MR. KAHAL HAVE INCORPORATED AN EX ANTE, OR FORWARD-LOOKING, MARKET EQUITY RISK PREMIUM?**

A. No. As noted previously, Mr. Kahal uses expected growth in his DCF analysis. Therefore, it is appropriate for him to have given weight to an expected market return such as the current forecasted market equity risk premium derived from Value Line's average median price appreciation potential and average median

expected dividend yield 3-5 years hence of 14.69%, as derived in note 2 on page 2 of Schedule PMA-3 Rebuttal which, when averaged with 6.70%, the arithmetic mean historical market equity risk premium for 1926-2010 results in a market equity risk premium of 10.70%.

**Q. YOU PREVIOUSLY STATED THAT MR. KAHAL DID NOT PERFORM AN EMPIRICAL CAPITAL ASSET PRICING MODEL ANALYSIS. PLEASE COMMENT.**

A. As discussed in my direct testimony at page 43, lines 25-35, although numerous tests of the CAPM have confirmed its validity, it has been determined that the empirical Security Market Line (SML) described by the traditional CAPM is not as steeply sloped as the predicted SML. Hence, the traditional CAPM understates the cost rate for common equity for companies with betas less than 1.0 and overstates the cost rate for companies with betas greater than 1.0. Mr. Kahal erred by not employing the ECAPM.

**Q. IS THERE ACADEMIC SUPPORT FOR THE USE OF THE ECAPM?**

A. Yes. Schedule PMA-4 Rebuttal contains an excerpt from Roger A. Morin's book, New Regulatory Finance (2006) which addresses the ECAPM. As Dr. Morin indicates, empirical research shows that the ECAPM process takes into account the failure of the traditional CAPM to compensate for the reality that the SML is not as steeply sloped as the predicted SML. In addition, contrary to Mr. Kahal's statement on page 37, lines 24-25 of his direct testimony, the ECAPM is not "mathematically equivalent to adjusting the beta upwards." As Roger A. Morin[6] states:

[6] Morin 191.

> The ECAPM and the use of adjusted betas comprise 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, Fama and French in "The Capital Asset Pricing Model: Theory and Evidence" in the *Journal of Economic Perspectives*, Summer 2004, Vol. 18 Issue 3 (Schedule PMA-5 Rebuttal), provide similar support for the ECAPM. On page 8 of Schedule PMA-5 Rebuttal, Fama and French note:

> The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too 'flat.' . . . The regressions consistently find that the intercept is greater than the average risk-free rate . . . and the coefficient on beta is less than the average excess market return. . . This is true in the early tests . . . as well as in more recent cross-section regressions tests, like Fama and French (1992).

Finally, Fama and French also note on page 9 of Schedule PMA-5 Rebuttal:

> Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Linter CAPM predicts. The returns on low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return as 11.1 percent. The predicted return on the portfolio with the t beta is 16.8 percent per year; the actual is 13.7 percent.

Clearly, then, Fama and French and their review of other academic research on the CAPM, validate the use of the ECAPM.

**Q. WHAT WOULD MR. KAHAL'S CAPM RESULT HAVE BEEN HAD HE CORRECTLY APPLIED THE CAPM INCLUDING A FORECASTED RISK-**

**FREE RATE, A PROPERLY CALCULATED MARKET EQUITY RISK PREMIUM AND THE ECAPM?**

A. It would have been 11.49%, as shown on Schedule PMA-3 Rebuttal presents a corrected traditional, as well as an empirical, CAPM using the forecasted yield on 30-year U.S. Treasury Bonds as the risk-free rate, and the appropriately calculated average historical market equity risk premium of 6.70% averaged with the average forecasted market equity risk premium of 14.69% as well as an ECAPM. As shown, the median traditional CAPM cost rate is 11.09%, while that of the empirical CAPM is 11.89%, averaging 11.49%. These properly calculated CAPM cost rates confirm that both Mr. Kahal's CAPM results ranging from 7.90% to 10.00% and his recommended common equity cost rate of 9.50% are grossly understated. In addition, these corrected CAPM cost rates misspecify UWRI's common equity cost rate because they do not reflect a downward adjustment for UWRI's lower financial risk and an upward adjustment for the relatively smaller size of UWRI.

**Q. BASED UPON YOUR CORRECTIONS TO MR. KAHAL'S CAPM COST RATE, WHAT WOULD HIS RANGE OF RECOMMENDED COMMON EQUITY COST RATE BE BEFORE ANY ADJUSTMENT FOR FINANCIAL AND BUSINESS RISK?**

A. As noted above, Mr. Kahal's recommended common equity cost rate is 9.50% based upon his DCF analysis. Since the corrected CAPM cost rate derived above is 11.49%, his range of common equity cost rates is 9.50% - 11.49%, with a midpoint of 10.50% before adjustments for financial and business risks.

Therefore, in view of all of the foregoing, his recommended cost of common equity of 9.50% should be rejected by the Commission.

**Q. MR. KAHAL'S ROE RECOMMENDATION DOES NOT INCLUDE A FINANCIAL RISK ADJUSTMENT. PLEASE COMMENT.**

A. As discussed in my direct testimony at pages 19 and 20, financial risk introduces additional risk to common shareholders which must be factored into the common equity cost rate, consistent with the basic financial principle of risk and return, i.e., investors demand a higher common equity return as compensation for bearing higher investment risk.

As noted on pages 2 and 3 of Schedule PMA-6 Rebuttal which is an excerpt from The Cost Of Capital – A Practitioner's Guide (2010), by David C Parcell prepared for the Society of Utility and Regulatory Analysts (SURFA) as the study manual for its Certified Rate of Return Analyst (CRRA) Program:

> A general principle of finance maintains that the financing structure of a company should be determined in conjunction with the perceived risk of the assets.
>
> * * *
>
> Financial risk refers to the capital structure of the firm and how this impacts the firm's after-tax net income and return on equity. Financial risk is created by the use of debt and preferred stock in the capital structure, which is called financial leverage. The use of leverage, or the use of fixed-cost financing with a (generally) lower cost than common equity, can have two impacts on a firm's return on equity. If the firms earns a return higher than the fixed-cost (i.e., leverage) capital, the firm's return on equity is enhanced. However, if the firm earns a return lower than the fixed-cost capital, the firm's return on equity is reduced. In the extreme, financial leverage can result in bankruptcy if the firm's earnings do not cover its fixed-cost rate and sufficient cash (from prior periods) is not on hand to pay the required payments to the owners of the fixed-cost capital.

Hence, an adjustment to Mr. Kahal's corrected range of common equity cost rates is required. Using the Hamada equation discussed in my direct testimony, on page 54, line 1 through page 55, line 6, a downward adjustment of 0.32% is warranted based upon Mr. Kahal's corrected CAPM analysis. Thus, his corrected range of common equity cost rates as adjusted for financial risk would range from 9.18%[7] - 11.17%. However, all of these cost rates understate the cost of equity for UWRI because they do not reflect the smaller size of UWRI relative to Mr. Kahal's proxy group as discussed below.

**Q. DO YOU HAVE ANY COMMENTS CONCERNING MR. KAHAL'S ASSERTION THAT A SIZE ADJUSTMENT IS NOT NECESSARY?**

A. Yes. In making his assertion that a size adjustment is not necessary, Mr. Kahal ignores the fact that it is the use of the funds and not the source of the funds which gives rise to risk and the risk-appropriate rate of return. It is the rate base of UWRI, and UWRI alone, to which the overall rate of return set in this proceeding will be applied. Hence, UWRI should be evaluated as a standalone utility. To do otherwise would be discriminatory and confiscatory. It is a generally-accepted financial principle that the risk of any investment is directly related to the assets in which the capital is invested. Just as with any other utility under its jurisdiction, the Commission must focus on the risk and return on the common equity investment in UWRI's jurisdictional rate base because it is UWRI's rates which will be set in this proceeding and it is UWRI's rate base which serves its ratepayers.

[7] 9.18% = 9.50% - 0.32%
11.17% = 11.49% - 0.32%

The risk of investment in UWRI's rate base is independent of the ownership or loaners of that capital. To reiterate, it is a basic financial principle that it is the use of the funds invested which gives rise to the risk of the investment, not the source of the funds. As Richard A. Brealey and Stewart C. Myers state in Principles of Corporate Finance[8]:

> *The true cost of capital depends on the use to which the capital is put.*
>
> * * *
>
> ***Each project should be evaluated at its own opportunity cost of capital; the true cost of capital depends on the use to which the capital is put.*** (italics and bold in original)

Hence, UWRI must be viewed on its own merits, regardless of the source of its capital.

For example, if one were to inherit money, free of charge, and then invest it in a given utility's common stock, one would require a rate of return on that stock commensurate with the risks to which that common stock investment is exposed. It would be illogical to require a zero return on one's investment in the utility's common stock just because there was zero cost in acquiring the capital, i.e., inherited money, which was the source of the investment. Even the Internal Revenue Service places the cost basis of an inheritor, on the market value of the inherited common stock on the date of death of the person who willed the stock to the inheritor and not on zero cost to the inheritor. As Bluefield[9] so clearly states:

> A public utility is entitled to such rates as will permit it to earn a

[8] Richard A. Brealey and Stewart C. Myers, Principles of Corporate Finance (McGraw-Hill Book Company, 1988) 173,198.

[9] Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 252 U.S. 679 (1922).

> return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; . . .

Bluefield is clear, then, that it is the "risks and uncertainties" surrounding the property employed for the "convenience of the public" which determines the appropriate level of rates and not the source of the capital financing that property. In this proceeding, the property employed "for the convenience of the public" is the rate base of UWRI. Therefore, it is the total investment risk of UWRI and its rate base alone that is relevant.

All else equal, one significant element of business risk is size as discussed on page 18, line 11 through page 19, line 21 of my direct testimony. Smaller companies are less capable of coping with significant events which affect sales revenues and earnings. Because UWRI is the regulated utility to whose rate base the Rhode Island Public Utilities Commission's (RI PUC) ultimately allowed overall cost of capital and fair rate of return will be applied, the relevant risk reflected in the cost of capital must be that of the UWRI, including the impact of its small size on common equity cost rate.

**Q. PLEASE COMPARE THE SIZE OF UWRI WITH THAT OF THE COMPANIES IN MR. KAHAL'S PROXY GROUP.**

A. I have made a study of the estimated market capitalization of UWRI relative to the proxy group of nine water companies. The results are shown on Schedule PMA-7 Rebuttal. Page 1 contains a summary of a small size risk adjustment based upon the Ibbotson® SBBI® – 2011 Valuation Yearbook – Market Results

for Stocks, Bonds, Bills and Inflation – 1926-2010 (SBBI – 2011) size premium study, while page 2 contains a summary of the market capitalizations as of October 18, 2011 as well as related notes. UWRI is significantly smaller than the average company in Mr. Kahal's proxy group based upon market capitalization as shown below:

Table 1

| | Market Capitalization ($ millions) | Times Greater than UWRI ($ Millions) |
|---|---|---|
| Mr. Kahal's Proxy Group of Water Utility Companies | $1,221.731 (1) | 125.6x |
| UWRI | 9.725 (2) | |

(1) From Line No. 2, page 1 of Schedule PMA-7 Rebuttal.

UWRI has no common stock which is publicly traded. Consequently, I have assumed that if it did and it were publicly traded, its common shares would be selling at the same market to book value as the average water company in the proxy group. Hence, UWRI's market capitalization is estimated to be $9.725 million as of October 18, 2011, based upon the proxy group of nine water companies. In contrast, the market capitalization of the average water company in the proxy group was $1.222 billion on October 18, 2011, or 125.6 times larger than UWRI's estimated market capitalization. It is conventional wisdom, supported by actual returns over time, that smaller companies tend to be more risky causing investors to expect greater returns as compensation for that risk

because smaller companies are simply less able to cope with significant events which affect sales, revenues and earnings as discussed in my direct testimony at pages 18 and 19. Pages 5-14 of Schedule PMA-12 of Exhibit No. ___ confirm this proposition to be true. As shown on page 1 of Schedule PMA-7 Rebuttal the average size premium for stocks in the 10th decile in which UWRI falls was 6.36% from 1926 – 2010. It is also shown on page 1 that the market capitalization of the average company in the 10th (smallest) decile was approximately $103.121 million, which is over ten times larger than UWRI with an estimated market capitalization of $9.725 million based upon the average market-to-book ratio of the nine water companies.

In view of UWRI's small estimated market capitalization, relative to the estimated average market capitalization of the nine water companies, it is reasonable to assume a small size risk premium of 4.51% or the difference between the size premium applicable to the 10th decile in which UWRI falls and the 6th and 7th deciles between which the nine water companies fall. In my opinion, although my adjustment to common equity cost rate to reflect the smaller size of UWRI is an extremely conservative 0.55%, the assumption of 4.51% as the risk premium represents a reasonable equity premium which would be applicable to UWRI.

Adding a conservative 0.55% size adjustment to the corrected financial risk-adjusted range of common equity cost rates of 9.18% - 11.17% results in a financial and business risk-adjusted range of common equity cost rates of

9.73%[10] - 11.72%, whose midpoint is 10.72%.

In view of the foregoing, Mr. Kahal's recommended 9.50% common equity cost rate is corroborated by a corrected CAPM analysis and should be rejected by this Commission.

## VI. RESPONSE TO CRITIQUE OF DIRECT TESTIMONY

**Q. MR. KAHAL STATES AT PAGE 37, LINES 9-11 THE ". . . THERE IS NO BASIS OR SUPPORT FOR THE USE OF THE ECAPM ADJUSTMENT IN THE CONTEXT OF THE UTILITY COST OF EQUITY. . ." PLEASE COMMENT.**

A. Mr. Kahal is mistaken. Jurisdictional regulatory precedent is provided in my direct testimony at pages 47 and 48 which shows that the opposite is true, that the ECAPM is supported in the utility cost of equity. Academic literature cited in both my direct and this testimony show an empirical need for the calculation of the ECAPM in a cost of common equity analysis.

**Q. MR. KAHAL ALSO DISPUTES YOUR USE OF PROJECTED RETURNS ON THE MARKET AND PROJECTED RISK-FREE RATES FROM WIDELY AVAILABLE, INVESTOR-INFLUENCING PUBLICATIONS SUCH AS VALUE LINE AND BLUE CHIP FINANCIAL FORECASTS. PLEASE COMMENT.**

A. As discussed above, both ratemaking and the cost of capital are prospective in nature. Therefore, it is appropriate to utility projected returns on the market and projected interest rates in cost of common equity analyses. In addition, to do so is consistent with Mr. Kahal's acknowledgment of the need to use prospective

[10] 9.73% = 9.18% + 0.55%
11.17% = 11.17% + 0.55%

growth in the DCF (page 25, line 2 of Mr. Kahal's direct testimony). Support regarding the use of prospective returns and interest rates is explained in detail in both my direct and this rebuttal testimony. Thus, I will not repeat it here.

**Q. MR. KAHAL CRITICIZES YOUR CEM ANALYSIS, STATING THAT IT IS NOT MARKET-BASED. PLEASE COMMENT.**

A. Mr. Kahal is incorrect. My methodology is market-based as the selection criteria are market-based using the average unadjusted beta and the average residual standard error of the regression which gave rise to the water company betas.

As explained in my direct testimony at pages 48-52, using comparable betas result in companies comparable in non-diversifiable market (systematic) risk. Using comparable standard errors of the regressions result in companies which are comparable in diversifiable (non-systematic) risk. Business and financial risks may vary between companies, but if the collective averages of the groups of non-price regulated companies chosen as proxies for the proxy group of water companies are similar, then the total, or aggregate, combined non-diversifiable market risks and diversifiable non-systematic risks are similar as noted in "Comparable Earnings: New Life for an Old Precept" provided in Schedule PMA-8 Rebuttal. *Thus, because the non-price regulated companies are selected based upon market data, they are comparable in total risk (even though individual risks may vary) to the proxy group of water companies.* Consequently, the expected rates of earnings on their book common equity are appropriate indicators of equity cost rates for the proxy groups of water companies because they are rates which are applicable to the common equity

financed portions of original cost (net book value) rate bases.

**Q. NEVERTHELESS, HAVE YOU APPLIED MARKET-BASED COST RATE OF COMMON EQUITY MODELS, I.E., THE DCF, RPM AND CAPM, TO YOUR UPDATED NON-UTILITY PROXY GROUP?**

A. Yes. The result of the DCF, RPM and CAPM models applied to the proxy group of non-utility companies comparable in total risk to the proxy group of nine water companies is 12.34% as shown on page 1 of Schedule PMA-9 Rebuttal.

**Q. MR. KAHAL REJECTS YOUR SIZE ADJUSTMENT TO YOUR RECOMMENDED ROE. DO YOU HAVE ANY COMMENT?**

A. Yes. As explained in detail previously, the cost of capital depends on the use to which capital is put and not on the source of that capital. Mr. Kahal's reasoning is flawed regarding the size adjustment and should be rejected.

## VII. UPDATED RECOMMENDED RATE OF RETURN ON COMMON EQUITY

**Q. HAVE YOU UPDATED YOUR RECOMMENDED RATE OF RETURN ON COMMON EQUITY FOR UWRI?**

A. Yes. My updated common equity cost rate recommendation of 11.75%. In arriving at my updated common equity cost rate recommendation, I have applied the same four cost of common equity models in an manner identical to their application in my direct testimony. However, in light of the current economic environment and capital market conditions, and in order to be reasonable if not conservative, the Company will maintain its request of an 11.10% return on common equity at this time which results in an updated overall rate of return for UWRI of 8.71 % using the capital structure ratios used in my direct testimony, an

updated long-term debt cost rate of 6.07% as shown on page 1 of Schedule PMA-10 Rebuttal.

**Q. DOES THAT CONCLUDE YOUR REBUTTAL TESTIMONY?**

A. Yes.

BEFORE THE

RHODE ISLAND PUBLIC UTILITY COMMISSION

EXHIBIT
TO ACCOMPANY THE

PREPARED REBUTTAL TESTIMONY

OF

PAULINE M. AHERN, CRRA
PRINCIPAL
AUS CONSULTANTS

CONCERNING

FAIR RATE OF RETURN

RE: UNITED WATER RHODE ISLAND, INC.

DOCKET NO. 4255

NOVEMBER 2011

STATE OF RHODE ISLAND PUBLIC UTILITIES COMMISSION
DOCKET NO. 4255
Response of United Water Rhode Island, Inc.
To The Division of Public Utilities And Carriers'
Data Requests
Set 5

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Div. 5-5: Please verify that the capital structure selected by Ms. Ahern excludes from equity "Accumulated other comprehensive income" of $3.3 million. In addition, please provide the following:

(a) A complete explanation of the rationale for this treatment or exclusion; and

(b) Any Rhode Island Commission precedent or support for this treatment or exclusion.

RESPONSE: The capital structure selected by Ms. Ahern does exclude from equity Accumulated Other Comprehensive Income of $3.3 million.

a) The Accumulated Other Comprehensive Income amount relates to the difference between Pension funding and actuarially determined pension expense for one United Waterworks operating unit (not UWRI). Since the amount has nothing to do with the results of operations, it was left out of the capital structure calculation.

b) The Company does not know of any Rhode Island Commission precedent or support for this treatment or exclusion.

Prepared by: Michaelson

United Water Rhode Island, Inc.
Example of the Inadequacy of
DCF Return Rate Related to Book Value
When Market Value Exceeds Book Value

| Line No. | | Based on Mr. Kahal's Proxy Group (a) Market Value | (b) Book Value |
|---|---|---|---|
| 1. | Per Share | $ 23.210 (1) | $ 13.410 (2) |
| 2. | DCF Cost Rate | 9.40% (3) | 9.40% (3) |
| 3. | Return in Dollars | $ 2.182 | $ 1.261 |
| 4. | Dividends | $ 0.789 (4) | $ 0.789 (4) |
| 5. | Growth in Dollars | $ 1.393 | $ 0.472 |
| 6. | Return on Market Value (5) | 9.40% | 5.43% |
| 7. | Rate of Growth on Market Value (6) | 6.00% | 2.03% |

Notes:
(1) Month-end prices from Standard & Poor's Stock Guide, April-September 2011.
(2) Derived from page 2 of Schedule PMA-6 Rebuttal.
(3) From Schedule MIK-4, page 1 of 4.
(4) Dividends per share based upon a 3.40% adjusted dividend yield. $0.789 = $23.210 * 3.40%.
(5) Line 3 / market value per share (line 1 column (a)).
(6) Line 6 - dividend yield (9.40% - 3.40% = 6.00%).

United Water Rhode Island, Inc.
Indicated Common Equity Cost Rate Through Use
of the Traditional Capital Asset Pricing Model (CAPM) and Empirical Capital Asset Pricing Model (ECAPM)

| | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Proxy Group of Nine Water Companies | Value Line Adjusted Beta | Market Risk Premium (1) | Risk-Free Rate (2) | Traditional CAPM Cost Rate (3) | ECAPM Cost Rate (4) | Indicated Common Equity Cost Rate (5) |
| American States Water Co. | 0.75 | 10.70 % | 3.60 % | 11.63 % | 12.29 % | |
| American Water Works Co., Inc. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Aqua America, Inc. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Artesian Resources Corp. | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| California Water Service Group | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Connecticut Water Service, Inc. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Middlesex Water Company | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| SJW Corporation | 0.90 | 10.70 | 3.60 | 13.23 | 13.50 | |
| York Water Company | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Average | | | | 11.33 % | 12.07 % | 11.70 % |
| Median | | | | 11.09 % | 11.89 % | 11.49 % |

See page 2 for notes.

United Water Rhode Island, Inc.
Development of the Market-Required Rate of Return on Common Equity Using
the Capital Asset Pricing Model for
the Proxy Group of Nine AUS Utility Reports Water Companies
Adjusted to Reflect a Forecasted Risk-Free Rate and Market Return

Notes:

(1) For reasons explained in Ms. Ahern's direct testimony, from the thirteen weeks ending October 21, 2011, Value Line Summary & Index, a forecasted 3-5 year total annual market return of 18.29% can be derived by averaging the thirteen weeks ended October 7, 2011 forecasted total 3-5 year total appreciation, converting it into an annual market appreciation and adding the Value Line average forecasted annual dividend yield.

The 3-5 year average total market appreciation of 81% produces a four-year average annual return of 15.99% ($(1.81^{.25}) - 1$). When the average annual forecasted dividend yield of 2.30% is added, a total average market return of 18.29% (2.30% + 15.99%) is derived.

The thirteen week forecasted total market return of 18.29% minus the forecasted risk-free rate of 3.60% (developed in Note 2) is 14.69% (18.29% - 3.60%). The Morningstar, Inc. (Ibbotson Associates) calculated market premium of 6.70% for the period 1926-2010 results from a total market return of 11.90% less the average income return on long-term U.S. Government Securities of 5.20% (11.90% - 5.20% = 6.70%). This is then averaged with the 14.69% Value Line market premium resulting in a 10.70% market premium. The 10.70% market premium is then multiplied by the beta in column 1 of page 1 of this Schedule.

(2) The average forecast based upon six quarterly estimates of 30-year Treasury Note yields per the consensus of nearly 50 economists reported in the Blue Chip Financial Forecasts dated April 1, 2011 (see page 3 of this Schedule). The estimates are detailed below:

| | 30-Year Treasury Note Yield |
|---|---|
| Fourth Quarter 2011 | 3.30 |
| First Quarter 2012 | 3.40 |
| Second Quarter 2012 | 3.50 |
| Third Quarter 2012 | 3.70 |
| Fourth Quarter 2012 | 3.80 |
| First Quarter 2013 | 3.90 |
| Average | 3.60% |

(3) The traditional Capital Asset Pricing Model (CAPM) is applied using the following formula:

$R_S = R_F + \beta (R_M - R_F)$

Where $R_S$ = Return rate of common stock
$R_F$ = Risk Free Rate
$\beta$ = Value Line Adjusted Beta
$R_M$ = Return on the market as a whole

(4) The empirical CAPM is applied using the following formula:

$R_S = R_F + .25 (R_M - R_F) + .75 \beta (R_M - R_F)$

Where $R_S$ = Return rate of common stock
$R_F$ = Risk-Free Rate
$\beta$ = Value Line Adjusted Beta
$R_M$ = Return on the market as a whole

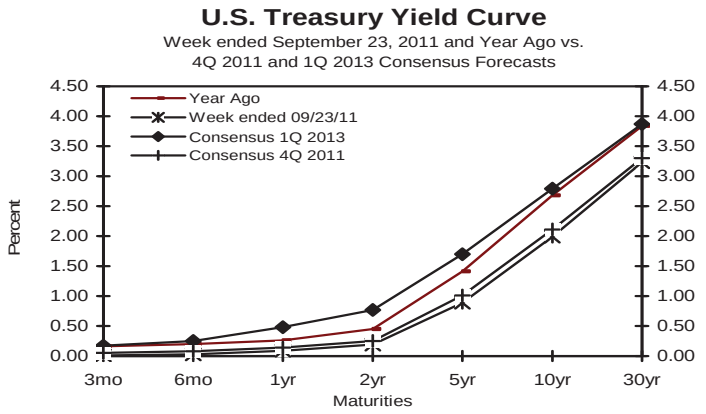
Source of Information: Value Line Summary & Index
Blue Chip Financial Forecasts, October 1, 2011
Value Line Investment Survey, October 21, 2011
Standard Edition and Small and Mid-Cap Edition
Ibbotson® SBBI® 2011 Valuation Yearbook – Market Results for
Stocks, Bonds, Bills, and Inflation – 1926 – 2010, Morningstar, Inc., 2011 Chicago, IL

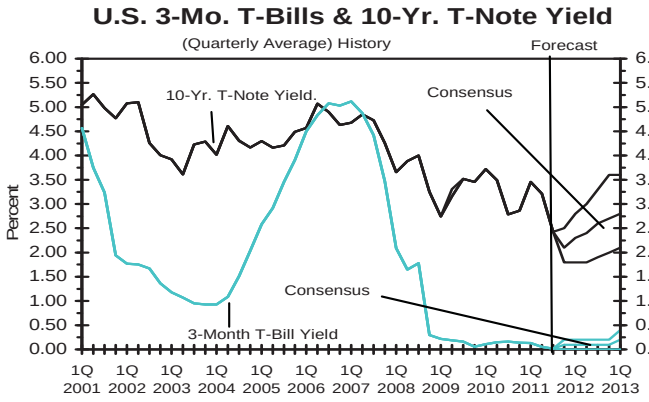
# Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

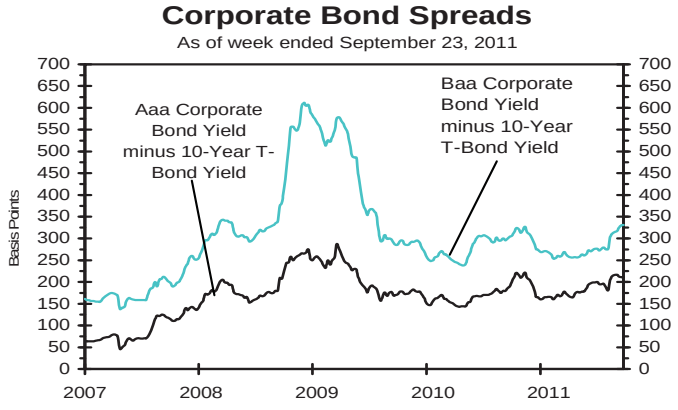
| Interest Rates | Sep. 23 | Sep. 16 | Sep. 9 | Sep. 2 | Aug. | July | June | *Latest Q** *3Q 2011* | **Consensus Forecasts-Quarterly Avg. 4Q 2011** | **1Q 2012** | **2Q 2012** | **3Q 2012** | **4Q 2012** | **1Q 2013** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Federal Funds Rate | 0.09 | 0.09 | 0.08 | 0.09 | 0.10 | 0.07 | 0.09 | *0.09* | **0.1** | **0.1** | **0.1** | **0.1** | **0.1** | **0.2** |
| Prime Rate | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | 3.25 | *3.25* | **3.3** | **3.3** | **3.3** | **3.3** | **3.3** | **3.3** |
| LIBOR, 3-mo. | 0.35 | 0.34 | 0.33 | 0.33 | 0.29 | 0.25 | 0.29 | *0.29* | **0.3** | **0.3** | **0.3** | **0.4** | **0.4** | **0.5** |
| Commercial Paper, 1-mo. | 0.09 | 0.09 | 0.09 | 0.09 | 0.11 | 0.09 | 0.11 | *0.10* | **0.1** | **0.2** | **0.2** | **0.2** | **0.3** | **0.3** |
| Treasury bill, 3-mo. | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.04 | 0.04 | *0.02* | **0.1** | **0.1** | **0.1** | **0.1** | **0.1** | **0.2** |
| Treasury bill, 6-mo. | 0.03 | 0.04 | 0.06 | 0.05 | 0.06 | 0.08 | 0.10 | *0.06* | **0.1** | **0.1** | **0.1** | **0.2** | **0.2** | **0.3** |
| Treasury bill, 1 yr. | 0.09 | 0.10 | 0.12 | 0.10 | 0.11 | 0.19 | 0.18 | *0.13* | **0.1** | **0.2** | **0.2** | **0.3** | **0.4** | **0.5** |
| Treasury note, 2 yr. | 0.19 | 0.20 | 0.20 | 0.20 | 0.23 | 0.41 | 0.41 | *0.28* | **0.3** | **0.3** | **0.4** | **0.5** | **0.6** | **0.8** |
| Treasury note, 5 yr. | 0.89 | 0.91 | 0.87 | 0.93 | 1.02 | 1.54 | 1.58 | *1.15* | **1.0** | **1.1** | **1.3** | **1.4** | **1.6** | **1.7** |
| Treasury note, 10 yr. | 1.99 | 2.03 | 1.99 | 2.17 | 2.30 | 3.00 | 3.00 | *2.43* | **2.1** | **2.3** | **2.4** | **2.6** | **2.7** | **2.8** |
| Treasury note, 30 yr. | 3.23 | 3.32 | 3.30 | 3.52 | 3.65 | 4.27 | 4.23 | *3.73* | **3.3** | **3.4** | **3.5** | **3.7** | **3.8** | **3.9** |
| Corporate Aaa bond | 4.10 | 4.14 | 4.11 | 4.34 | 4.37 | 4.93 | 4.99 | *4.47* | **4.2** | **4.2** | **4.3** | **4.4** | **4.5** | **4.6** |
| Corporate Baa bond | 5.30 | 5.33 | 5.24 | 5.34 | 5.36 | 5.76 | 5.75 | *5.47* | **5.3** | **5.3** | **5.3** | **5.4** | **5.5** | **5.6** |
| State & Local bonds | 3.85 | 4.07 | 4.05 | 4.14 | 4.02 | 4.52 | 4.51 | *4.18* | **3.9** | **3.9** | **4.0** | **4.1** | **4.2** | **4.2** |
| Home mortgage rate | 4.09 | 4.09 | 4.12 | 4.22 | 4.27 | 4.55 | 4.51 | *4.31* | **4.1** | **4.1** | **4.2** | **4.3** | **4.5** | **4.6** |

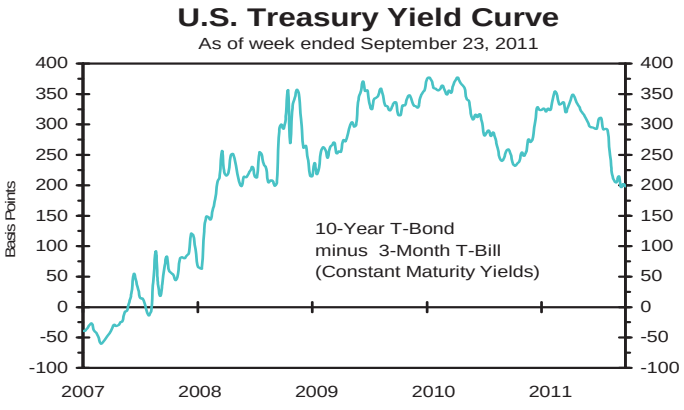
| Key Assumptions | 4Q 2009 | 1Q 2010 | 2Q 2010 | 3Q 2010 | 4Q 2010 | 1Q 2011 | 2Q 2011 | *3Q** *2011* | **Consensus Forecasts-Quarterly 4Q 2011** | **1Q 2012** | **2Q 2012** | **3Q 2012** | **4Q 2012** | **1Q 2013** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Major Currency Index | 72.8 | 74.8 | 77.6 | 75.9 | 73.0 | 71.9 | 69.6 | *69.5* | **70.5** | **70.6** | **70.6** | **70.6** | **70.6** | **71.2** |
| Real GDP | 3.8 | 3.9 | 3.8 | 2.5 | 2.3 | 0.4 | 1.0 | *1.9* | **2.0** | **2.0** | **2.3** | **2.6** | **2.8** | **2.8** |
| GDP Price Index | 1.1 | 1.5 | 1.5 | 1.4 | 1.9 | 2.5 | 2.4 | *2.0* | **1.8** | **2.0** | **1.9** | **1.9** | **1.9** | **2.1** |
| Consumer Price Index | 2.7 | 1.3 | -0.5 | 1.4 | 2.6 | 5.2 | 4.1 | *2.7* | **2.1** | **2.1** | **2.1** | **2.3** | **2.2** | **2.3** |

Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical data for interest rates except LIBOR is from Federal Reserve Release (FRSR) H.15. LIBOR quotes available from *The Wall Street Journal*. Interest rate definitions are the same as those in FRSR H.15. Treasury yields are reported on a constant maturity basis. Historical data for the Fed's Major Currency Index is from FRSR H.10 and G.5. Historical data for Real GDP and GDP Chained Price Index are from the Bureau of Economic Analysis (BEA). Consumer Price Index (CPI) history is from the Department of Labor's Bureau of Labor Statistics (BLS). ***Interest rate data for 3Q 2011 based on historical data through the week ended September 23rd. *Data for 3Q 2011 Major Currency Index also is based on data through week ended September 23rd. Figures for 3Q 2011 Real GDP, GDP Chained Price Index and Consumer Price Index are consensus forecasts based on a special question asked of the panelists this month (see page 14)***.



# NEW
# REGULATORY
# FINANCE

Roger A. Morin, PhD

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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:

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

where $\acute{\alpha}$ 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 $\acute{\alpha}$, 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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# The Capital Asset Pricing Model: Theory and Evidence

Eugene F. Fama and Kenneth R. French

The capital asset pricing model (CAPM) of William Sharpe (1964) and John Lintner (1965) marks the birth of asset pricing theory (resulting in a Nobel Prize for Sharpe in 1990). Four decades later, the CAPM is still widely used in applications, such as estimating the cost of capital for firms and evaluating the performance of managed portfolios. It is the centerpiece of MBA investment courses. Indeed, it is often the only asset pricing model taught in these courses.[1]

The attraction of the CAPM is that it offers powerful and intuitively pleasing predictions about how to measure risk and the relation between expected return and risk. Unfortunately, the empirical record of the model is poor—poor enough to invalidate the way it is used in applications. The CAPM's empirical problems may reflect theoretical failings, the result of many simplifying assumptions. But they may also be caused by difficulties in implementing valid tests of the model. For example, the CAPM says that the risk of a stock should be measured relative to a comprehensive "market portfolio" that in principle can include not just traded financial assets, but also consumer durables, real estate and human capital. Even if we take a narrow view of the model and limit its purview to traded financial assets, is it

[1] Although every asset pricing model is a capital asset pricing model, the finance profession reserves the acronym CAPM for the specific model of Sharpe (1964), Lintner (1965) and Black (1972) discussed here. Thus, throughout the paper we refer to the Sharpe-Lintner-Black model as the CAPM.

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legitimate to limit further the market portfolio to U.S. common stocks (a typical choice), or should the market be expanded to include bonds, and other financial assets, perhaps around the world? In the end, we argue that whether the model's problems reflect weaknesses in the theory or in its empirical implementation, the failure of the CAPM in empirical tests implies that most applications of the model are invalid.

We begin by outlining the logic of the CAPM, focusing on its predictions about risk and expected return. We then review the history of empirical work and what it says about shortcomings of the CAPM that pose challenges to be explained by alternative models.

## The Logic of the CAPM

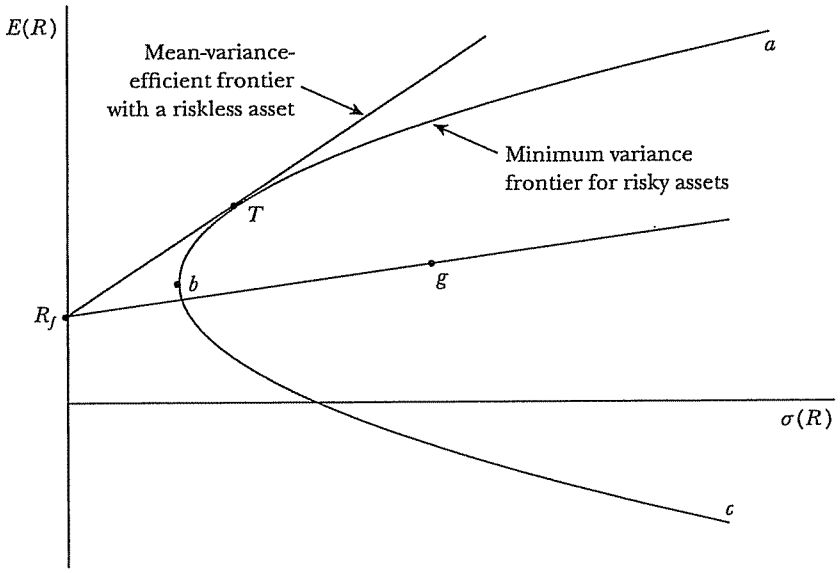
The CAPM builds on the model of portfolio choice developed by Harry Markowitz (1959). In Markowitz's model, an investor selects a portfolio at time $t - 1$ that produces a stochastic return at $t$. The model assumes investors are risk averse and, when choosing among portfolios, they care only about the mean and variance of their one-period investment return. As a result, investors choose "mean-variance-efficient" portfolios, in the sense that the portfolios 1) minimize the variance of portfolio return, given expected return, and 2) maximize expected return, given variance. Thus, the Markowitz approach is often called a "mean-variance model."

The portfolio model provides an algebraic condition on asset weights in mean-variance-efficient portfolios. The CAPM turns this algebraic statement into a testable prediction about the relation between risk and expected return by identifying a portfolio that must be efficient if asset prices are to clear the market of all assets.

Sharpe (1964) and Lintner (1965) add two key assumptions to the Markowitz model to identify a portfolio that must be mean-variance-efficient. The first assumption is *complete agreement*: given market clearing asset prices at $t - 1$, investors agree on the joint distribution of asset returns from $t - 1$ to $t$. And this distribution is the true one—that is, it is the distribution from which the returns we use to test the model are drawn. The second assumption is that there is *borrowing and lending at a risk-free rate*, which is the same for all investors and does not depend on the amount borrowed or lent.

Figure 1 describes portfolio opportunities and tells the CAPM story. The horizontal axis shows portfolio risk, measured by the standard deviation of portfolio return; the vertical axis shows expected return. The curve *abc*, which is called the minimum variance frontier, traces combinations of expected return and risk for portfolios of risky assets that minimize return variance at different levels of expected return. (These portfolios do not include risk-free borrowing and lending.) The tradeoff between risk and expected return for minimum variance portfolios is apparent. For example, an investor who wants a high expected return, perhaps at point $a$, must accept high volatility. At point $T$, the investor can have an interme-

*Figure 1*
**Investment Opportunities**




diate expected return with lower volatility. If there is no risk-free borrowing or lending, only portfolios above $b$ along $abc$ are mean-variance-efficient, since these portfolios also maximize expected return, given their return variances.

Adding risk-free borrowing and lending turns the efficient set into a straight line. Consider a portfolio that invests the proportion $x$ of portfolio funds in a risk-free security and $1 - x$ in some portfolio $g$. If all funds are invested in the risk-free security—that is, they are loaned at the risk-free rate of interest—the result is the point $R_f$ in Figure 1, a portfolio with zero variance and a risk-free rate of return. Combinations of risk-free lending and positive investment in $g$ plot on the straight line between $R_f$ and $g$. Points to the right of $g$ on the line represent borrowing at the risk-free rate, with the proceeds from the borrowing used to increase investment in portfolio $g$. In short, portfolios that combine risk-free lending or borrowing with some risky portfolio $g$ plot along a straight line from $R_f$ through $g$ in Figure 1.[2]

[2] Formally, the return, expected return and standard deviation of return on portfolios of the risk-free asset $f$ and a risky portfolio $g$ vary with $x$, the proportion of portfolio funds invested in $f$, as

$$R_p = xR_f + (1 - x)R_g,$$

$$E(R_p) = xR_f + (1 - x)E(R_g),$$

$$\sigma(R_p) = (1 - x)\sigma(R_g),\ x \leq 1.0,$$

which together imply that the portfolios plot along the line from $R_f$ through $g$ in Figure 1.

To obtain the mean-variance-efficient portfolios available with risk-free borrowing and lending, one swings a line from $R_f$ in Figure 1 up and to the left as far as possible, to the tangency portfolio $T$. We can then see that all efficient portfolios are combinations of the risk-free asset (either risk-free borrowing or lending) and a single risky tangency portfolio, $T$. This key result is Tobin's (1958) "separation theorem."

The punch line of the CAPM is now straightforward. With complete agreement about distributions of returns, all investors see the same opportunity set (Figure 1), and they combine the same risky tangency portfolio $T$ with risk-free lending or borrowing. Since all investors hold the same portfolio $T$ of risky assets, it must be the value-weight market portfolio of risky assets. Specifically, each risky asset's weight in the tangency portfolio, which we now call $M$ (for the "market"), must be the total market value of all outstanding units of the asset divided by the total market value of all risky assets. In addition, the risk-free rate must be set (along with the prices of risky assets) to clear the market for risk-free borrowing and lending.

In short, the CAPM assumptions imply that the market portfolio $M$ must be on the minimum variance frontier if the asset market is to clear. This means that the algebraic relation that holds for any minimum variance portfolio must hold for the market portfolio. Specifically, if there are $N$ risky assets,

$$\text{(Minimum Variance Condition for } M) \quad E(R_i) = E(R_{ZM}) + [E(R_M) - E(R_{ZM})]\beta_{iM}, \; i = 1, \ldots, N.$$

In this equation, $E(R_i)$ is the expected return on asset $i$, and $\beta_{iM}$, the market beta of asset $i$, is the covariance of its return with the market return divided by the variance of the market return,

$$\text{(Market Beta)} \quad \beta_{iM} = \frac{\text{cov}(R_i, R_M)}{\sigma^2(R_M)}.$$

The first term on the right-hand side of the minimum variance condition, $E(R_{ZM})$, is the expected return on assets that have market betas equal to zero, which means their returns are uncorrelated with the market return. The second term is a risk premium—the market beta of asset $i$, $\beta_{iM}$, times the premium per unit of beta, which is the expected market return, $E(R_M)$, minus $E(R_{ZM})$.

Since the market beta of asset $i$ is also the slope in the regression of its return on the market return, a common (and correct) interpretation of beta is that it measures the sensitivity of the asset's return to variation in the market return. But there is another interpretation of beta more in line with the spirit of the portfolio model that underlies the CAPM. The risk of the market portfolio, as measured by the variance of its return (the denominator of $\beta_{iM}$), is a weighted average of the covariance risks of the assets in $M$ (the numerators of $\beta_{iM}$ for different assets).

Thus, $\beta_{iM}$ is the covariance risk of asset $i$ in $M$ measured relative to the average covariance risk of assets, which is just the variance of the market return.[3] In economic terms, $\beta_{iM}$ is proportional to the risk each dollar invested in asset $i$ contributes to the market portfolio.

The last step in the development of the Sharpe-Lintner model is to use the assumption of risk-free borrowing and lending to nail down $E(R_{ZM})$, the expected return on zero-beta assets. A risky asset's return is uncorrelated with the market return—its beta is zero—when the average of the asset's covariances with the returns on other assets just offsets the variance of the asset's return. Such a risky asset is riskless in the market portfolio in the sense that it contributes nothing to the variance of the market return.

When there is risk-free borrowing and lending, the expected return on assets that are uncorrelated with the market return, $E(R_{ZM})$, must equal the risk-free rate, $R_f$. The relation between expected return and beta then becomes the familiar Sharpe-Lintner CAPM equation,

$$\text{(Sharpe-Lintner CAPM)} \quad E(R_i) = R_f + [E(R_M) - R_f]\beta_{iM}, \; i = 1, \ldots, N.$$

In words, the expected return on any asset $i$ is the risk-free interest rate, $R_f$, plus a risk premium, which is the asset's market beta, $\beta_{iM}$, times the premium per unit of beta risk, $E(R_M) - R_f$.

Unrestricted risk-free borrowing and lending is an unrealistic assumption. Fischer Black (1972) develops a version of the CAPM without risk-free borrowing or lending. He shows that the CAPM's key result—that the market portfolio is mean-variance-efficient—can be obtained by instead allowing unrestricted short sales of risky assets. In brief, back in Figure 1, if there is no risk-free asset, investors select portfolios from along the mean-variance-efficient frontier from $a$ to $b$. Market clearing prices imply that when one weights the efficient portfolios chosen by investors by their (positive) shares of aggregate invested wealth, the resulting portfolio is the market portfolio. The market portfolio is thus a portfolio of the efficient portfolios chosen by investors. With unrestricted short selling of risky assets, portfolios made up of efficient portfolios are themselves efficient. Thus, the market portfolio is efficient, which means that the minimum variance condition for $M$ given above holds, and it is the expected return-risk relation of the Black CAPM.

The relations between expected return and market beta of the Black and Sharpe-Lintner versions of the CAPM differ only in terms of what each says about $E(R_{ZM})$, the expected return on assets uncorrelated with the market. The Black version says only that $E(R_{ZM})$ must be less than the expected market return, so the

[3] Formally, if $x_{iM}$ is the weight of asset $i$ in the market portfolio, then the variance of the portfolio's return is

$$\sigma^2(R_M) = Cov(R_M, R_M) = Cov\left(\sum_{i=1}^{N} x_{iM}R_i, R_M\right) = \sum_{i=1}^{N} x_{iM}Cov(R_i, R_M).$$

premium for beta is positive. In contrast, in the Sharpe-Lintner version of the model, $E(R_{ZM})$ must be the risk-free interest rate, $R_f$, and the premium per unit of beta risk is $E(R_M) - R_f$.

The assumption that short selling is unrestricted is as unrealistic as unrestricted risk-free borrowing and lending. If there is no risk-free asset and short sales of risky assets are not allowed, mean-variance investors still choose efficient portfolios—points above *b* on the *abc* curve in Figure 1. But when there is no short selling of risky assets and no risk-free asset, the algebra of portfolio efficiency says that portfolios made up of efficient portfolios are not typically efficient. This means that the market portfolio, which is a portfolio of the efficient portfolios chosen by investors, is not typically efficient. And the CAPM relation between expected return and market beta is lost. This does not rule out predictions about expected return and betas with respect to other efficient portfolios—if theory can specify portfolios that must be efficient if the market is to clear. But so far this has proven impossible.

In short, the familiar CAPM equation relating expected asset returns to their market betas is just an application to the market portfolio of the relation between expected return and portfolio beta that holds in any mean-variance-efficient portfolio. The efficiency of the market portfolio is based on many unrealistic assumptions, including complete agreement and either unrestricted risk-free borrowing and lending or unrestricted short selling of risky assets. But all interesting models involve unrealistic simplifications, which is why they must be tested against data.

## Early Empirical Tests

Tests of the CAPM are based on three implications of the relation between expected return and market beta implied by the model. First, expected returns on all assets are linearly related to their betas, and no other variable has marginal explanatory power. Second, the beta premium is positive, meaning that the expected return on the market portfolio exceeds the expected return on assets whose returns are uncorrelated with the market return. Third, in the Sharpe-Lintner version of the model, assets uncorrelated with the market have expected returns equal to the risk-free interest rate, and the beta premium is the expected market return minus the risk-free rate. Most tests of these predictions use either cross-section or time-series regressions. Both approaches date to early tests of the model.

### Tests on Risk Premiums

The early cross-section regression tests focus on the Sharpe-Lintner model's predictions about the intercept and slope in the relation between expected return and market beta. The approach is to regress a cross-section of average asset returns on estimates of asset betas. The model predicts that the intercept in these regressions is the risk-free interest rate, $R_f$, and the coefficient on beta is the expected return on the market in excess of the risk-free rate, $E(R_M) - R_f$.

Two problems in these tests quickly became apparent. First, estimates of beta

for individual assets are imprecise, creating a measurement error problem when they are used to explain average returns. Second, the regression residuals have common sources of variation, such as industry effects in average returns. Positive correlation in the residuals produces downward bias in the usual ordinary least squares estimates of the standard errors of the cross-section regression slopes.

To improve the precision of estimated betas, researchers such as Blume (1970), Friend and Blume (1970) and Black, Jensen and Scholes (1972) work with portfolios, rather than individual securities. Since expected returns and market betas combine in the same way in portfolios, if the CAPM explains security returns it also explains portfolio returns.[4] Estimates of beta for diversified portfolios are more precise than estimates for individual securities. Thus, using portfolios in cross-section regressions of average returns on betas reduces the critical errors in variables problem. Grouping, however, shrinks the range of betas and reduces statistical power. To mitigate this problem, researchers sort securities on beta when forming portfolios; the first portfolio contains securities with the lowest betas, and so on, up to the last portfolio with the highest beta assets. This sorting procedure is now standard in empirical tests.

Fama and MacBeth (1973) propose a method for addressing the inference problem caused by correlation of the residuals in cross-section regressions. Instead of estimating a single cross-section regression of average monthly returns on betas, they estimate month-by-month cross-section regressions of monthly returns on betas. The times-series means of the monthly slopes and intercepts, along with the standard errors of the means, are then used to test whether the average premium for beta is positive and whether the average return on assets uncorrelated with the market is equal to the average risk-free interest rate. In this approach, the standard errors of the average intercept and slope are determined by the month-to-month variation in the regression coefficients, which fully captures the effects of residual correlation on variation in the regression coefficients, but sidesteps the problem of actually estimating the correlations. The residual correlations are, in effect, captured via repeated sampling of the regression coefficients. This approach also becomes standard in the literature.

Jensen (1968) was the first to note that the Sharpe-Lintner version of the

[4] Formally, if $x_{ip}$, $i = 1, \ldots, N$, are the weights for assets in some portfolio $p$, the expected return and market beta for the portfolio are related to the expected returns and betas of assets as

$$E(R_p) = \sum_{i=1}^{N} x_{ip}E(R_i), \text{ and } \beta_{pM} = \sum_{i=1}^{N} x_{ip}\beta_{pM}.$$

Thus, the CAPM relation between expected return and beta,

$$E(R_i) = E(R_f) + [E(R_M) - E(R_f)]\beta_{iM},$$

holds when asset $i$ is a portfolio, as well as when $i$ is an individual security.

relation between expected return and market beta also implies a time-series regression test. The Sharpe-Lintner CAPM says that the expected value of an asset's excess return (the asset's return minus the risk-free interest rate, $R_{it} - R_{ft}$) is completely explained by its expected CAPM risk premium (its beta times the expected value of $R_{Mt} - R_{ft}$). This implies that "Jensen's alpha," the intercept term in the time-series regression,

$$\text{(Time-Series Regression)} \quad R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \varepsilon_{it},$$

is zero for each asset.

The early tests firmly reject the Sharpe-Lintner version of the CAPM. There is a positive relation between beta and average return, but it is too "flat." Recall that, in cross-section regressions, the Sharpe-Lintner model predicts that the intercept is the risk-free rate and the coefficient on beta is the expected market return in excess of the risk-free rate, $E(R_M) - R_f$. The regressions consistently find that the intercept is greater than the average risk-free rate (typically proxied as the return on a one-month Treasury bill), and the coefficient on beta is less than the average excess market return (proxied as the average return on a portfolio of U.S. common stocks minus the Treasury bill rate). This is true in the early tests, such as Douglas (1968), Black, Jensen and Scholes (1972), Miller and Scholes (1972), Blume and Friend (1973) and Fama and MacBeth (1973), as well as in more recent cross-section regression tests, like Fama and French (1992).

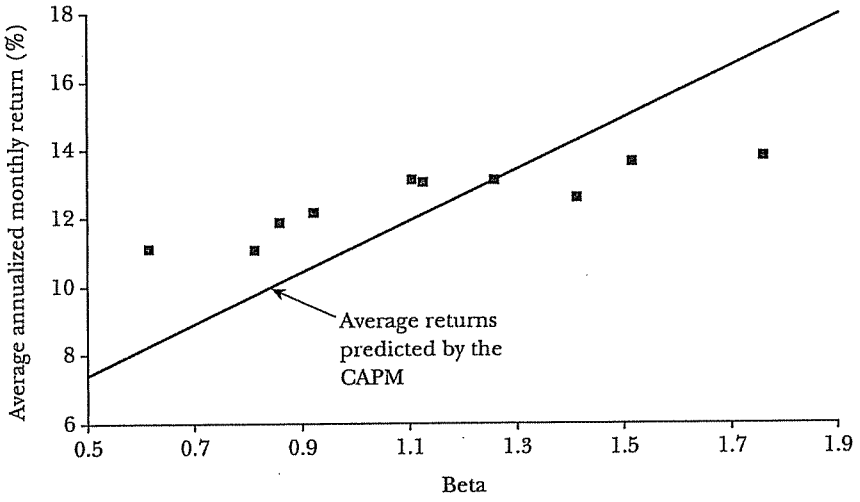
The evidence that the relation between beta and average return is too flat is confirmed in time-series tests, such as Friend and Blume (1970), Black, Jensen and Scholes (1972) and Stambaugh (1982). The intercepts in time-series regressions of excess asset returns on the excess market return are positive for assets with low betas and negative for assets with high betas.

Figure 2 provides an updated example of the evidence. In December of each year, we estimate a preranking beta for every NYSE (1928–2003), AMEX (1963–2003) and NASDAQ (1972–2003) stock in the CRSP (Center for Research in Security Prices of the University of Chicago) database, using two to five years (as available) of prior monthly returns.[5] We then form ten value-weight portfolios based on these preranking betas and compute their returns for the next twelve months. We repeat this process for each year from 1928 to 2003. The result is 912 monthly returns on ten beta-sorted portfolios. Figure 2 plots each portfolio's average return against its postranking beta, estimated by regressing its monthly returns for 1928–2003 on the return on the CRSP value-weight portfolio of U.S. common stocks.

The Sharpe-Lintner CAPM predicts that the portfolios plot along a straight

[5] To be included in the sample for year $t$, a security must have market equity data (price times shares outstanding) for December of $t - 1$, and CRSP must classify it as ordinary common equity. Thus, we exclude securities such as American Depository Receipts (ADRs) and Real Estate Investment Trusts (REITs).

*Figure 2*
**Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on Prior Beta, 1928–2003**




line, with an intercept equal to the risk-free rate, $R_f$, and a slope equal to the expected excess return on the market, $E(R_M) - R_f$. We use the average one-month Treasury bill rate and the average excess CRSP market return for 1928–2003 to estimate the predicted line in Figure 2. Confirming earlier evidence, the relation between beta and average return for the ten portfolios is much flatter than the Sharpe-Lintner CAPM predicts. The returns on the low beta portfolios are too high, and the returns on the high beta portfolios are too low. For example, the predicted return on the portfolio with the lowest beta is 8.3 percent per year; the actual return is 11.1 percent. The predicted return on the portfolio with the highest beta is 16.8 percent per year; the actual is 13.7 percent.

Although the observed premium per unit of beta is lower than the Sharpe-Lintner model predicts, the relation between average return and beta in Figure 2 is roughly linear. This is consistent with the Black version of the CAPM, which predicts only that the beta premium is positive. Even this less restrictive model, however, eventually succumbs to the data.

**Testing Whether Market Betas Explain Expected Returns**

The Sharpe-Lintner and Black versions of the CAPM share the prediction that the market portfolio is mean-variance-efficient. This implies that differences in expected return across securities and portfolios are entirely explained by differences in market beta; other variables should add nothing to the explanation of expected return. This prediction plays a prominent role in tests of the CAPM. In the early work, the weapon of choice is cross-section regressions.

In the framework of Fama and MacBeth (1973), one simply adds predetermined explanatory variables to the month-by-month cross-section regressions of

returns on beta. If all differences in expected return are explained by beta, the average slopes on the additional variables should not be reliably different from zero. Clearly, the trick in the cross-section regression approach is to choose specific additional variables likely to expose any problems of the CAPM prediction that, because the market portfolio is efficient, market betas suffice to explain expected asset returns.

For example, in Fama and MacBeth (1973) the additional variables are squared market betas (to test the prediction that the relation between expected return and beta is linear) and residual variances from regressions of returns on the market return (to test the prediction that market beta is the only measure of risk needed to explain expected returns). These variables do not add to the explanation of average returns provided by beta. Thus, the results of Fama and MacBeth (1973) are consistent with the hypothesis that their market proxy—an equal-weight portfolio of NYSE stocks—is on the minimum variance frontier.

The hypothesis that market betas completely explain expected returns can also be tested using time-series regressions. In the time-series regression described above (the excess return on asset $i$ regressed on the excess market return), the intercept is the difference between the asset's average excess return and the excess return predicted by the Sharpe-Lintner model, that is, beta times the average excess market return. If the model holds, there is no way to group assets into portfolios whose intercepts are reliably different from zero. For example, the intercepts for a portfolio of stocks with high ratios of earnings to price and a portfolio of stocks with low earning-price ratios should both be zero. Thus, to test the hypothesis that market betas suffice to explain expected returns, one estimates the time-series regression for a set of assets (or portfolios) and then jointly tests the vector of regression intercepts against zero. The trick in this approach is to choose the left-hand-side assets (or portfolios) in a way likely to expose any shortcoming of the CAPM prediction that market betas suffice to explain expected asset returns.

In early applications, researchers use a variety of tests to determine whether the intercepts in a set of time-series regressions are all zero. The tests have the same asymptotic properties, but there is controversy about which has the best small sample properties. Gibbons, Ross and Shanken (1989) settle the debate by providing an $F$-test on the intercepts that has exact small-sample properties. They also show that the test has a simple economic interpretation. In effect, the test constructs a candidate for the tangency portfolio $T$ in Figure 1 by optimally combining the market proxy and the left-hand-side assets of the time-series regressions. The estimator then tests whether the efficient set provided by the combination of this tangency portfolio and the risk-free asset is reliably superior to the one obtained by combining the risk-free asset with the market proxy alone. In other words, the Gibbons, Ross and Shanken statistic tests whether the market proxy is the tangency portfolio in the set of portfolios that can be constructed by combining the market portfolio with the specific assets used as dependent variables in the time-series regressions.

Enlightened by this insight of Gibbons, Ross and Shanken (1989), one can see

a similar interpretation of the cross-section regression test of whether market betas suffice to explain expected returns. In this case, the test is whether the additional explanatory variables in a cross-section regression identify patterns in the returns on the left-hand-side assets that are not explained by the assets' market betas. This amounts to testing whether the market proxy is on the minimum variance frontier that can be constructed using the market proxy and the left-hand-side assets included in the tests.

An important lesson from this discussion is that time-series and cross-section regressions do not, strictly speaking, test the CAPM. What is literally tested is whether a specific proxy for the market portfolio (typically a portfolio of U.S. common stocks) is efficient in the set of portfolios that can be constructed from it and the left-hand-side assets used in the test. One might conclude from this that the CAPM has never been tested, and prospects for testing it are not good because 1) the set of left-hand-side assets does not include all marketable assets, and 2) data for the true market portfolio of all assets are likely beyond reach (Roll, 1977; more on this later). But this criticism can be leveled at tests of any economic model when the tests are less than exhaustive or when they use proxies for the variables called for by the model.

The bottom line from the early cross-section regression tests of the CAPM, such as Fama and MacBeth (1973), and the early time-series regression tests, like Gibbons (1982) and Stambaugh (1982), is that standard market proxies seem to be on the minimum variance frontier. That is, the central predictions of the Black version of the CAPM, that market betas suffice to explain expected returns and that the risk premium for beta is positive, seem to hold. But the more specific prediction of the Sharpe-Lintner CAPM that the premium per unit of beta is the expected market return minus the risk-free interest rate is consistently rejected.

The success of the Black version of the CAPM in early tests produced a consensus that the model is a good description of expected returns. These early results, coupled with the model's simplicity and intuitive appeal, pushed the CAPM to the forefront of finance.

## Recent Tests

Starting in the late 1970s, empirical work appears that challenges even the Black version of the CAPM. Specifically, evidence mounts that much of the variation in expected return is unrelated to market beta.

The first blow is Basu's (1977) evidence that when common stocks are sorted on earnings-price ratios, future returns on high E/P stocks are higher than predicted by the CAPM. Banz (1981) documents a size effect: when stocks are sorted on market capitalization (price times shares outstanding), average returns on small stocks are higher than predicted by the CAPM. Bhandari (1988) finds that high debt-equity ratios (book value of debt over the market value of equity, a measure of leverage) are associated with returns that are too high relative to their market betas.

Finally, Statman (1980) and Rosenberg, Reid and Lanstein (1985) document that stocks with high book-to-market equity ratios (B/M, the ratio of the book value of a common stock to its market value) have high average returns that are not captured by their betas.

There is a theme in the contradictions of the CAPM summarized above. Ratios involving stock prices have information about expected returns missed by market betas. On reflection, this is not surprising. A stock's price depends not only on the expected cash flows it will provide, but also on the expected returns that discount expected cash flows back to the present. Thus, in principle, the cross-section of prices has information about the cross-section of expected returns. (A high expected return implies a high discount rate and a low price.) The cross-section of stock prices is, however, arbitrarily affected by differences in scale (or units). But with a judicious choice of scaling variable $X$, the ratio $X/P$ can reveal differences in the cross-section of expected stock returns. Such ratios are thus prime candidates to expose shortcomings of asset pricing models—in the case of the CAPM, shortcomings of the prediction that market betas suffice to explain expected returns (Ball, 1978). The contradictions of the CAPM summarized above suggest that earnings-price, debt-equity and book-to-market ratios indeed play this role.

Fama and French (1992) update and synthesize the evidence on the empirical failures of the CAPM. Using the cross-section regression approach, they confirm that size, earnings-price, debt-equity and book-to-market ratios add to the explanation of expected stock returns provided by market beta. Fama and French (1996) reach the same conclusion using the time-series regression approach applied to portfolios of stocks sorted on price ratios. They also find that different price ratios have much the same information about expected returns. This is not surprising given that price is the common driving force in the price ratios, and the numerators are just scaling variables used to extract the information in price about expected returns.

Fama and French (1992) also confirm the evidence (Reinganum, 1981; Stambaugh, 1982; Lakonishok and Shapiro, 1986) that the relation between average return and beta for common stocks is even flatter after the sample periods used in the early empirical work on the CAPM. The estimate of the beta premium is, however, clouded by statistical uncertainty (a large standard error). Kothari, Shanken and Sloan (1995) try to resuscitate the Sharpe-Lintner CAPM by arguing that the weak relation between average return and beta is just a chance result. But the strong evidence that other variables capture variation in expected return missed by beta makes this argument irrelevant. If betas do not suffice to explain expected returns, the market portfolio is not efficient, and the CAPM is dead in its tracks. Evidence on the size of the market premium can neither save the model nor further doom it.

The synthesis of the evidence on the empirical problems of the CAPM provided by Fama and French (1992) serves as a catalyst, marking the point when it is generally acknowledged that the CAPM has potentially fatal problems. Research then turns to explanations.

One possibility is that the CAPM's problems are spurious, the result of data dredging—publication-hungry researchers scouring the data and unearthing contradictions that occur in specific samples as a result of chance. A standard response to this concern is to test for similar findings in other samples. Chan, Hamao and Lakonishok (1991) find a strong relation between book-to-market equity (B/M) and average return for Japanese stocks. Capaul, Rowley and Sharpe (1993) observe a similar B/M effect in four European stock markets and in Japan. Fama and French (1998) find that the price ratios that produce problems for the CAPM in U.S. data show up in the same way in the stock returns of twelve non-U.S. major markets, and they are present in emerging market returns. This evidence suggests that the contradictions of the CAPM associated with price ratios are not sample specific.

## Explanations: Irrational Pricing or Risk

Among those who conclude that the empirical failures of the CAPM are fatal, two stories emerge. On one side are the behavioralists. Their view is based on evidence that stocks with high ratios of book value to market price are typically firms that have fallen on bad times, while low B/M is associated with growth firms (Lakonishok, Shleifer and Vishny, 1994; Fama and French, 1995). The behavioralists argue that sorting firms on book-to-market ratios exposes investor overreaction to good and bad times. Investors overextrapolate past performance, resulting in stock prices that are too high for growth (low B/M) firms and too low for distressed (high B/M, so-called value) firms. When the overreaction is eventually corrected, the result is high returns for value stocks and low returns for growth stocks. Proponents of this view include DeBondt and Thaler (1987), Lakonishok, Shleifer and Vishny (1994) and Haugen (1995).

The second story for explaining the empirical contradictions of the CAPM is that they point to the need for a more complicated asset pricing model. The CAPM is based on many unrealistic assumptions. For example, the assumption that investors care only about the mean and variance of one-period portfolio returns is extreme. It is reasonable that investors also care about how their portfolio return covaries with labor income and future investment opportunities, so a portfolio's return variance misses important dimensions of risk. If so, market beta is not a complete description of an asset's risk, and we should not be surprised to find that differences in expected return are not completely explained by differences in beta. In this view, the search should turn to asset pricing models that do a better job explaining average returns.

Merton's (1973) intertemporal capital asset pricing model (ICAPM) is a natural extension of the CAPM. The ICAPM begins with a different assumption about investor objectives. In the CAPM, investors care only about the wealth their portfolio produces at the end of the current period. In the ICAPM, investors are concerned not only with their end-of-period payoff, but also with the opportunities

they will have to consume or invest the payoff. Thus, when choosing a portfolio at time $t - 1$, ICAPM investors consider how their wealth at $t$ might vary with future *state variables,* including labor income, the prices of consumption goods and the nature of portfolio opportunities at $t$, and expectations about the labor income, consumption and investment opportunities to be available after $t$.

Like CAPM investors, ICAPM investors prefer high expected return and low return variance. But ICAPM investors are also concerned with the covariances of portfolio returns with state variables. As a result, optimal portfolios are "multifactor efficient," which means they have the largest possible expected returns, given their return variances and the covariances of their returns with the relevant state variables.

Fama (1996) shows that the ICAPM generalizes the logic of the CAPM. That is, if there is risk-free borrowing and lending or if short sales of risky assets are allowed, market clearing prices imply that the market portfolio is multifactor efficient. Moreover, multifactor efficiency implies a relation between expected return and beta risks, but it requires additional betas, along with a market beta, to explain expected returns.

An ideal implementation of the ICAPM would specify the state variables that affect expected returns. Fama and French (1993) take a more indirect approach, perhaps more in the spirit of Ross's (1976) arbitrage pricing theory. They argue that though size and book-to-market equity are not themselves state variables, the higher average returns on small stocks and high book-to-market stocks reflect unidentified state variables that produce undiversifiable risks (covariances) in returns that are not captured by the market return and are priced separately from market betas. In support of this claim, they show that the returns on the stocks of small firms covary more with one another than with returns on the stocks of large firms, and returns on high book-to-market (value) stocks covary more with one another than with returns on low book-to-market (growth) stocks. Fama and French (1995) show that there are similar size and book-to-market patterns in the covariation of fundamentals like earnings and sales.

Based on this evidence, Fama and French (1993, 1996) propose a three-factor model for expected returns,

$$\text{(Three-Factor Model)} \quad E(R_{it}) - R_{ft} = \beta_{iM}[E(R_{Mt}) - R_{ft}] + \beta_{is}E(SMB_t) + \beta_{ih}E(HML_t).$$

In this equation, $SMB_t$ (small minus big) is the difference between the returns on diversified portfolios of small and big stocks, $HML_t$ (high minus low) is the difference between the returns on diversified portfolios of high and low B/M stocks, and the betas are slopes in the multiple regression of $R_{it} - R_{ft}$ on $R_{Mt} - R_{ft}$, $SMB_t$ and $HML_t$.

For perspective, the average value of the market premium $R_{Mt} - R_{ft}$ for 1927–2003 is 8.3 percent per year, which is 3.5 standard errors from zero. The

average values of $SMB_t$, and $HML_t$ are 3.6 percent and 5.0 percent per year, and they are 2.1 and 3.1 standard errors from zero. All three premiums are volatile, with annual standard deviations of 21.0 percent ($R_{Mt} - R_{ft}$), 14.6 percent ($SMB_t$) and 14.2 percent ($HML_t$) per year. Although the average values of the premiums are large, high volatility implies substantial uncertainty about the true expected premiums.

One implication of the expected return equation of the three-factor model is that the intercept $\alpha_i$ in the time-series regression,

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{is}SMB_t + \beta_{ih}HML_t + \varepsilon_{it},$$

is zero for all assets $i$. Using this criterion, Fama and French (1993, 1996) find that the model captures much of the variation in average return for portfolios formed on size, book-to-market equity and other price ratios that cause problems for the CAPM. Fama and French (1998) show that an international version of the model performs better than an international CAPM in describing average returns on portfolios formed on scaled price variables for stocks in 13 major markets.

The three-factor model is now widely used in empirical research that requires a model of expected returns. Estimates of $\alpha_i$ from the time-series regression above are used to calibrate how rapidly stock prices respond to new information (for example, Loughran and Ritter, 1995; Mitchell and Stafford, 2000). They are also used to measure the special information of portfolio managers, for example, in Carhart's (1997) study of mutual fund performance. Among practitioners like Ibbotson Associates, the model is offered as an alternative to the CAPM for estimating the cost of equity capital.

From a theoretical perspective, the main shortcoming of the three-factor model is its empirical motivation. The small-minus-big (SMB) and high-minus-low (HML) explanatory returns are not motivated by predictions about state variables of concern to investors. Instead they are brute force constructs meant to capture the patterns uncovered by previous work on how average stock returns vary with size and the book-to-market equity ratio.

But this concern is not fatal. The ICAPM does not require that the additional portfolios used along with the market portfolio to explain expected returns "mimic" the relevant state variables. In both the ICAPM and the arbitrage pricing theory, it suffices that the additional portfolios are well diversified (in the terminology of Fama, 1996, they are multifactor minimum variance) and that they are sufficiently different from the market portfolio to capture covariation in returns and variation in expected returns missed by the market portfolio. Thus, adding diversified portfolios that capture covariation in returns and variation in average returns left unexplained by the market is in the spirit of both the ICAPM and the Ross's arbitrage pricing theory.

The behavioralists are not impressed by the evidence for a risk-based explanation of the failures of the CAPM. They typically concede that the three-factor model captures covariation in returns missed by the market return and that it picks

up much of the size and value effects in average returns left unexplained by the CAPM. But their view is that the average return premium associated with the model's book-to-market factor—which does the heavy lifting in the improvements to the CAPM—is itself the result of investor overreaction that happens to be correlated across firms in a way that just looks like a risk story. In short, in the behavioral view, the market tries to set CAPM prices, and violations of the CAPM are due to mispricing.

The conflict between the behavioral irrational pricing story and the rational risk story for the empirical failures of the CAPM leaves us at a timeworn impasse. Fama (1970) emphasizes that the hypothesis that prices properly reflect available information must be tested in the context of a model of expected returns, like the CAPM. Intuitively, to test whether prices are rational, one must take a stand on what the market is trying to do in setting prices—that is, what is risk and what is the relation between expected return and risk? When tests reject the CAPM, one cannot say whether the problem is its assumption that prices are rational (the behavioral view) or violations of other assumptions that are also necessary to produce the CAPM (our position).

Fortunately, for some applications, the way one uses the three-factor model does not depend on one's view about whether its average return premiums are the rational result of underlying state variable risks, the result of irrational investor behavior or sample specific results of chance. For example, when measuring the response of stock prices to new information or when evaluating the performance of managed portfolios, one wants to account for known patterns in returns and average returns for the period examined, whatever their source. Similarly, when estimating the cost of equity capital, one might be unconcerned with whether expected return premiums are rational or irrational since they are in either case part of the opportunity cost of equity capital (Stein, 1996). But the cost of capital is forward looking, so if the premiums are sample specific they are irrelevant.

The three-factor model is hardly a panacea. Its most serious problem is the momentum effect of Jegadeesh and Titman (1993). Stocks that do well relative to the market over the last three to twelve months tend to continue to do well for the next few months, and stocks that do poorly continue to do poorly. This momentum effect is distinct from the value effect captured by book-to-market equity and other price ratios. Moreover, the momentum effect is left unexplained by the three-factor model, as well as by the CAPM. Following Carhart (1997), one response is to add a momentum factor (the difference between the returns on diversified portfolios of short-term winners and losers) to the three-factor model. This step is again legitimate in applications where the goal is to abstract from known patterns in average returns to uncover information-specific or manager-specific effects. But since the momentum effect is short-lived, it is largely irrelevant for estimates of the cost of equity capital.

Another strand of research points to problems in both the three-factor model and the CAPM. Frankel and Lee (1998), Dechow, Hutton and Sloan (1999), Piotroski (2000) and others show that in portfolios formed on price ratios like

book-to-market equity, stocks with higher expected cash flows have higher average returns that are not captured by the three-factor model or the CAPM. The authors interpret their results as evidence that stock prices are irrational, in the sense that they do not reflect available information about expected profitability.

In truth, however, one can't tell whether the problem is bad pricing or a bad asset pricing model. A stock's price can always be expressed as the present value of expected future cash flows discounted at the expected return on the stock (Campbell and Shiller, 1989; Vuolteenaho, 2002). It follows that if two stocks have the same price, the one with higher expected cash flows must have a higher expected return. This holds true whether pricing is rational or irrational. Thus, when one observes a positive relation between expected cash flows and expected returns that is left unexplained by the CAPM or the three-factor model, one can't tell whether it is the result of irrational pricing or a misspecified asset pricing model.

## The Market Proxy Problem

Roll (1977) argues that the CAPM has never been tested and probably never will be. The problem is that the market portfolio at the heart of the model is theoretically and empirically elusive. It is not theoretically clear which assets (for example, human capital) can legitimately be excluded from the market portfolio, and data availability substantially limits the assets that are included. As a result, tests of the CAPM are forced to use proxies for the market portfolio, in effect testing whether the proxies are on the minimum variance frontier. Roll argues that because the tests use proxies, not the true market portfolio, we learn nothing about the CAPM.

We are more pragmatic. The relation between expected return and market beta of the CAPM is just the minimum variance condition that holds in any efficient portfolio, applied to the market portfolio. Thus, if we can find a market proxy that is on the minimum variance frontier, it can be used to describe differences in expected returns, and we would be happy to use it for this purpose. The strong rejections of the CAPM described above, however, say that researchers have not uncovered a reasonable market proxy that is close to the minimum variance frontier. If researchers are constrained to reasonable proxies, we doubt they ever will.

Our pessimism is fueled by several empirical results. Stambaugh (1982) tests the CAPM using a range of market portfolios that include, in addition to U.S. common stocks, corporate and government bonds, preferred stocks, real estate and other consumer durables. He finds that tests of the CAPM are not sensitive to expanding the market proxy beyond common stocks, basically because the volatility of expanded market returns is dominated by the volatility of stock returns.

One need not be convinced by Stambaugh's (1982) results since his market proxies are limited to U.S. assets. If international capital markets are open and asset prices conform to an international version of the CAPM, the market portfolio

should include international assets. Fama and French (1998) find, however, that betas for a global stock market portfolio cannot explain the high average returns observed around the world on stocks with high book-to-market or high earnings-price ratios.

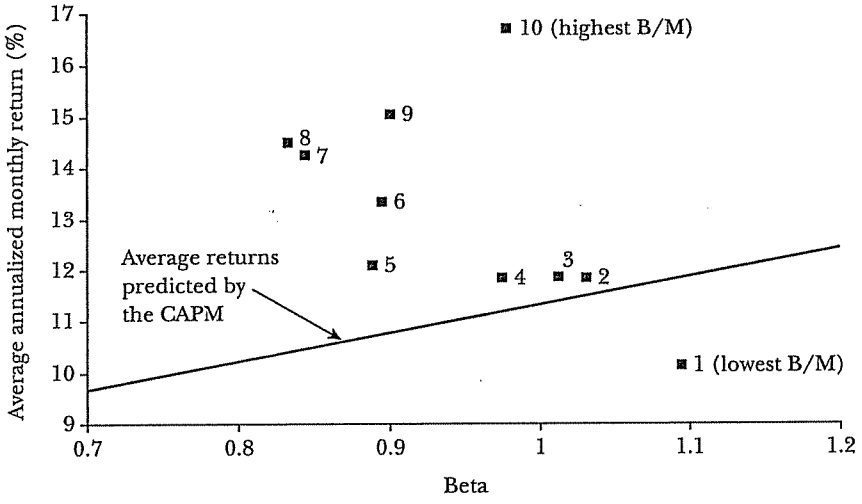
A major problem for the CAPM is that portfolios formed by sorting stocks on price ratios produce a wide range of average returns, but the average returns are not positively related to market betas (Lakonishok, Shleifer and Vishny, 1994; Fama and French, 1996, 1998). The problem is illustrated in Figure 3, which shows average returns and betas (calculated with respect to the CRSP value-weight portfolio of NYSE, AMEX and NASDAQ stocks) for July 1963 to December 2003 for ten portfolios of U.S. stocks formed annually on sorted values of the book-to-market equity ratio (B/M).[6]

Average returns on the B/M portfolios increase almost monotonically, from 10.1 percent per year for the lowest B/M group (portfolio 1) to an impressive 16.7 percent for the highest (portfolio 10). But the positive relation between beta and average return predicted by the CAPM is notably absent. For example, the portfolio with the lowest book-to-market ratio has the highest beta but the lowest average return. The estimated beta for the portfolio with the highest book-to-market ratio and the highest average return is only 0.98. With an average annualized value of the riskfree interest rate, $R_f$, of 5.8 percent and an average annualized market premium, $R_M - R_f$, of 11.3 percent, the Sharpe-Lintner CAPM predicts an average return of 11.8 percent for the lowest B/M portfolio and 11.2 percent for the highest, far from the observed values, 10.1 and 16.7 percent. For the Sharpe-Lintner model to "work" on these portfolios, their market betas must change dramatically, from 1.09 to 0.78 for the lowest B/M portfolio and from 0.98 to 1.98 for the highest. We judge it unlikely that alternative proxies for the market portfolio will produce betas and a market premium that can explain the average returns on these portfolios.

It is always possible that researchers will redeem the CAPM by finding a reasonable proxy for the market portfolio that is on the minimum variance frontier. We emphasize, however, that this possibility cannot be used to justify the way the CAPM is currently applied. The problem is that applications typically use the same

[6] Stock return data are from CRSP, and book equity data are from Compustat and the Moody's Industrials, Transportation, Utilities and Financials manuals. Stocks are allocated to ten portfolios at the end of June of each year $t$ (1963 to 2003) using the ratio of book equity for the fiscal year ending in calendar year $t - 1$, divided by market equity at the end of December of $t - 1$. Book equity is the book value of stockholders' equity, plus balance sheet deferred taxes and investment tax credit (if available), minus the book value of preferred stock. Depending on availability, we use the redemption, liquidation or par value (in that order) to estimate the book value of preferred stock. Stockholders' equity is the value reported by Moody's or Compustat, if it is available. If not, we measure stockholders' equity as the book value of common equity plus the par value of preferred stock or the book value of assets minus total liabilities (in that order). The portfolios for year $t$ include NYSE (1963–2003), AMEX (1963–2003) and NASDAQ (1972–2003) stocks with positive book equity in $t - 1$ and market equity (from CRSP) for December of $t - 1$ and June of $t$. The portfolios exclude securities CRSP does not classify as ordinary common equity. The breakpoints for year $t$ use only securities that are on the NYSE in June of year $t$.

*Figure 3*
**Average Annualized Monthly Return versus Beta for Value Weight Portfolios Formed on B/M, 1963–2003**




market proxies, like the value-weight portfolio of U.S. stocks, that lead to rejections of the model in empirical tests. The contradictions of the CAPM observed when such proxies are used in tests of the model show up as bad estimates of expected returns in applications; for example, estimates of the cost of equity capital that are too low (relative to historical average returns) for small stocks and for stocks with high book-to-market equity ratios. In short, if a market proxy does not work in tests of the CAPM, it does not work in applications.

## Conclusions

The version of the CAPM developed by Sharpe (1964) and Lintner (1965) has never been an empirical success. In the early empirical work, the Black (1972) version of the model, which can accommodate a flatter tradeoff of average return for market beta, has some success. But in the late 1970s, research begins to uncover variables like size, various price ratios and momentum that add to the explanation of average returns provided by beta. The problems are serious enough to invalidate most applications of the CAPM.

For example, finance textbooks often recommend using the Sharpe-Lintner CAPM risk-return relation to estimate the cost of equity capital. The prescription is to estimate a stock's market beta and combine it with the risk-free interest rate and the average market risk premium to produce an estimate of the cost of equity. The typical market portfolio in these exercises includes just U.S. common stocks. But empirical work, old and new, tells us that the relation between beta and average return is flatter than predicted by the Sharpe-Lintner version of the CAPM. As a

result, CAPM estimates of the cost of equity for high beta stocks are too high (relative to historical average returns) and estimates for low beta stocks are too low (Friend and Blume, 1970). Similarly, if the high average returns on value stocks (with high book-to-market ratios) imply high expected returns, CAPM cost of equity estimates for such stocks are too low.[7]

The CAPM is also often used to measure the performance of mutual funds and other managed portfolios. The approach, dating to Jensen (1968), is to estimate the CAPM time-series regression for a portfolio and use the intercept (Jensen's alpha) to measure abnormal performance. The problem is that, because of the empirical failings of the CAPM, even passively managed stock portfolios produce abnormal returns if their investment strategies involve tilts toward CAPM problems (Elton, Gruber, Das and Hlavka, 1993). For example, funds that concentrate on low beta stocks, small stocks or value stocks will tend to produce positive abnormal returns relative to the predictions of the Sharpe-Lintner CAPM, even when the fund managers have no special talent for picking winners.

The CAPM, like Markowitz's (1952, 1959) portfolio model on which it is built, is nevertheless a theoretical tour de force. We continue to teach the CAPM as an introduction to the fundamental concepts of portfolio theory and asset pricing, to be built on by more complicated models like Merton's (1973) ICAPM. But we also warn students that despite its seductive simplicity, the CAPM's empirical problems probably invalidate its use in applications.

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[7] The problems are compounded by the large standard errors of estimates of the market premium and of betas for individual stocks, which probably suffice to make CAPM estimates of the cost of equity rather meaningless, even if the CAPM holds (Fama and French, 1997; Pastor and Stambaugh, 1999). For example, using the U.S. Treasury bill rate as the risk-free interest rate and the CRSP value-weight portfolio of publicly traded U.S. common stocks, the average value of the equity premium $R_{Mt} - R_{ft}$ for 1927–2003 is 8.3 percent per year, with a standard error of 2.4 percent. The two standard error range thus runs from 3.5 percent to 13.1 percent, which is sufficient to make most projects appear either profitable or unprofitable. This problem is, however, hardly special to the CAPM. For example, expected returns in all versions of Merton's (1973) ICAPM include a market beta and the expected market premium. Also, as noted earlier the expected values of the size and book-to-market premiums in the Fama-French three-factor model are also estimated with substantial error.

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# THE COST OF CAPITAL –

# A PRACTITIONER'S GUIDE

## BY

## DAVID C. PARCELL

**PREPARED FOR THE SOCIETY OF UTILITY AND REGULATORY FINANCIAL ANALYSTS (SURFA)**

**2010 EDITION**

**Author's Note: This manual has been prepared as an educational reference on cost of capital concepts. Its purpose is to describe a broad array of cost of capital models and techniques. No cost of equity model or other concept is recommended or emphasized, nor is any procedure for employing any model recommended. Furthermore, no opinions or preferences are expressed by either the author or the Society of Utility and Regulatory Financial Analysts.**

**TABLE 4.1**
**COMMON EQUITY RATIOS**

| Utility Group | Common Equity Ratio* |
|---|---|
| Electric Utilities | 47% |
| Combination Electric & Gas Utilities | 45% |
| Natural Gas Distribution & Integrated Natural Gas Companies | 52% |
| Water Companies | 46% |

* Including short-term debt.

Source: AUS Utility Reports, September, 2010

## Risk and Leverage

A general principle of finance maintains that the financing structure of a company should be determined in conjunction with the perceived risk of the assets. The obvious intuitive appeal of this principle goes back at least to Adam Smith (1776, 110-111) who stated:

> "...something must be given for the profits of the undertaker of the work who hazards his stock (capital) in this adventure... In all the different employments of stock, the ordinary rate of profit varies more or less with the certainty or uncertainty of the returns...the ordinary rate of profit always rises more or less with the risk."

Risk, in this context, can be segregated into two components - business risk and financial risk. Business risk refers to the risk inherent in the level and composition of a firm's assets, as well as the nature of the business in which the firm is engaged. In essence, business risk is reflected in the variability of the pre-tax operating income stream which the firm faces. A firm with a relatively low level of earnings variability is said to have low business risk while a firm with a relatively high level of earnings variability is said to have high business risk. Business risk is not related to the manner in which the firm finances its assets.

Financial risk refers to the capital structure of the firm and how this impacts the firm's after-tax net income and return on equity. Financial risk is created by the use of debt and preferred stock in the capital structure, which is called financial leverage. The use of leverage, or the use of fixed-cost financing with a (generally) lower cost than common equity, can have two impacts on a firm's return on equity. If the firm earns a return higher than the fixed-cost (i.e., leveraged) capital, the firm's return on equity is enhanced. However, if the firm earns a return lower than the fixed-cost capital, the firm's return on equity is reduced. In the extreme, financial leverage can result in bankruptcy if the firm's earnings do not cover its fixed-cost rates and sufficient cash (from prior periods) is not on hand to pay the required payments to the owners of the fixed-cost capital.

## Capital Structure Issues

Several issues are encountered in the selection of a proper capital structure for ratemaking purposes.

### Reconciling Rate Base and Capital Structure

As noted in Chapter 2, the rate base - rate of return concept is based on the recognition that rate base (assets) are financed with the capital structure (liabilities and equity). An inherent assumption of this concept is that the rate base and capital structure are equal in size. In reality, this assumption is not always true.

Cicchetti (1985, 41) has observed "The reconciliation of the rate base and the capital structure is an integral, and often overlooked, segment of determining the required overall rate of return". Rate base and capitalization may differ for a number of reasons, including the existence of non-utility assets and the regulatory disallowance of certain assets.

One method for reconciling rate base and capital structure is known as the "balance sheet method". This methodology begins with defining the usual rate base items (net plant in service, property held for future use, construction work in progress, and working capital) and then equating this with the capital structure items financing the rate base. As adjustments are made to remove

United Water Rhode Island, Inc.
Derivation of Investment Risk Adjustment Based upon
Ibbotson Associates' Size Premia for the Decile Portfolios of the NYSE/AMEX/NASDAQ

| Line No. | | 1 Market Capitalization on October 18, 2011 (1) ( millions ) | (times larger) | 2 Applicable Decile of the NYSE/AMEX/ NASDAQ (2) | 3 Applicable Size Premium (3) | 4 Spread from Applicable Size Premium for (4) |
|---|---|---|---|---|---|---|
| 1. | United Water Rhode Island, Inc. | | | | | |
| a. | Based Upon the Proxy Group of Nine Water Companies | $ 9.725 | | 10 | 6.36% | |
| 2. | Proxy Group of Nine Water Companies | $ 1,221.731 | 125.6 x | 6 - 7 | 1.85% | 4.51% |

| | (A) Decile | (B) Number of Companies ( millions ) | (C ) Recent Total Market Capitalization ( millions ) | (D) Recent Average Market Capitalization ( millions ) | (E) Size Premium (Return in Excess of CAPM) (2) |
|---|---|---|---|---|---|
| Largest | 1 | 168 | $ 8,586,385.656 | $ 51,109.438 | -0.38% |
| | 2 | 181 | 1,873,378.709 | $ 10,350.159 | 0.81% |
| | 3 | 187 | 1,022,604.243 | $ 5,468.472 | 1.01% |
| | 4 | 185 | 594,702.185 | $ 3,214.606 | 1.20% |
| | 5 | 213 | 482,327.242 | $ 2,264.447 | 1.81% |
| | 6 | 230 | 360,140.550 | $ 1,565.828 | 1.82% |
| | 7 | 287 | 304,948.414 | $ 1,062.538 | 1.88% |
| | 8 | 361 | 239,018.595 | $ 662.101 | 2.65% |
| | 9 | 491 | 181,744.805 | $ 370.152 | 2.94% |
| Smallest | 10 | 1320 | 136,119.075 | $ 103.121 | 6.36% |

*From Ibbotson 2011 Yearbook

Notes:
(1) From Page 2 of this Schedule.
(2) Gleaned from Column (D) on the bottom of this page. The appropriate decile (Column (A)) corresponds to the market capitalization of the proxy group, which is found in Column 1.
(3) Corresponding risk premium to the decile is provided on Column (E) on the bottom of this page.
(4) Line No. 1a Column 3 – Line No. 2 Column 3 and Line No. 1b, Column 3 – Line No. 3 of Column 3 etc.. For example, the 4.51% in Column 4, Line No. 2 is derived as follows 4.51% = 6.36% - 1.85%.

Exhibit No. ___
Schedule PMA-7 Rebuttal
Page 1 of 2

United Water Rhode Island, Inc.
Market Capitalization of United Water Rhode Island, Inc. and
the Proxy Group of Nine Water Companies

| | | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| Company | Exchange | Common Stock Shares Outstanding at Fiscal Year End 2010 ( millions ) | Book Value per Share at Fiscal Year End 2010 (1) | Total Common Equity at Fiscal Year End 2010 ( millions ) | Closing Stock Market Price on October 18, 2011 | Market-to-Book Ratio on October 18, 2011 (2) | Market Capitalization on October 18, 2011 (3) ( millions ) |
| United Water Rhode Island, Inc. | | NA | NA | $ 5.346 (4) | NA | | |
| Based Upon the Proxy Group of Nine Water Companies | | | | | | 181.9 % (5) | $ 9.725 (6) |
| Proxy Group of Nine Water Companies | | | | | | | |
| American States Water Co. | | 18.631 | $ 20.264 | $ 377.541 | $ 34.860 | 172.0 % | $ 649.471 |
| American Water Works Co., Inc. | | 174.996 | $ 23.614 | $ 4,132.272 | $ 30.360 | 128.6 | $ 5,312.879 |
| Aqua America, Inc. | | 138.449 | $ 8.481 | $ 1,174.254 | $ 21.550 | 254.1 | $ 2,983.577 |
| Artesian Resources Corp. | | 7.517 | $ 12.657 | $ 95.146 | $ 18.320 | 144.7 | $ 137.714 |
| California Water Service Group | | 41.666 | $ 10.453 | $ 435.526 | $ 18.150 | 173.6 | $ 756.238 |
| Connecticut Water Service, Inc. | | 8.677 | $ 13.134 | $ 113.963 | $ 25.970 | 197.7 | $ 225.338 |
| Middlesex Water Company | | 15.566 | $ 11.132 | $ 173.279 | $ 17.780 | 159.7 | $ 276.763 |
| SJW Corporation | | 18.552 | $ 13.747 | $ 255.032 | $ 23.690 | 172.3 | $ 439.486 |
| York Water Company | | 12.692 | $ 7.190 | $ 91.257 | $ 16.870 | 234.6 | $ 214.115 |
| Average | | 48.527 | $ 13.408 | $ 760.919 | $ 23.061 | 181.9 % | $ 1,221.731 |

NA= Not Available

Notes: (1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 5 * Column 3.
(4) Allocation of total capitalization of United Water Rhode Island at 12/31/2010 of $10.228 million by the requested common equity ratio of 52.27% ($10.228 M x 52.27% = $5.346 M).
(5) The market-to-book ratio of United Water Rhode Island, Inc. on October 18, 2011 is assumed to be equal to the market-to-book ratio of the Proxy Group of Nine Water Companies at October 18, 2011.
(6) United Water Rhode Island, Inc.'s common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 18, 2011 of the Proxy Group of Nine Water Companies, 181.9%, and United Water Rhode Island, Inc.'s market capitalization on October 18, 2011 would therefore have been $9.725 million.

Source of Information: 2010 Annual Forms 10K
yahoo.finance.com

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# Comparable Earnings: New Life for an Old Precept

by
Frank J. Hanley
Pauline M. Ahern

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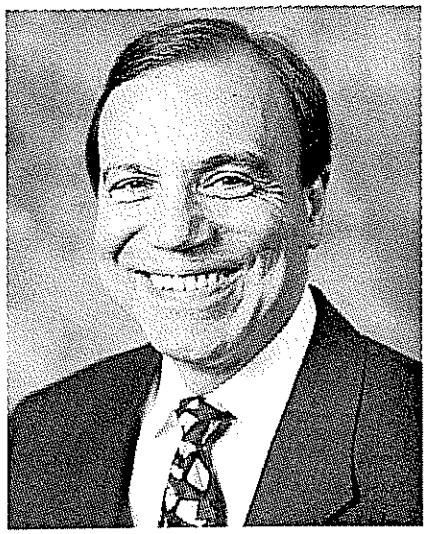
# Comparable Earnings: New Life for an Old Precept

*Accelerating deregulation has greatly increased the investment risk of natural gas utilities. As a result, the authors believe it more appropriate than ever to employ the comparable earnings model. We believe our application of the model overcomes the greatest traditional objection to it — lack of comparability of the selected non-utility proxy firms. Our illustration focuses on a target gas pipeline company with a beta of 0.96 — almost equal to the market's beta of 1.00.*



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## Introduction

The comparable earnings model used to determine a common equity cost rate is deeply rooted in the standard of "corresponding risk" enunciated in the landmark *Bluefield* and *Hope* decisions of the U.S. Supreme Court.[1] With such solid grounding in the foundations of rate of return regulation, comparable earnings should be accepted as a principal model, along with the currently popular market-based models, provided that its most common criticism, non-comparability of the proxy companies, is overcome.

Our comparable earnings model overcomes the non-comparability issue of the non-utility firms selected as a proxy for the target utility, in this example, a gas pipeline company. We should note that in the absence of common stock prices for the target utility (as with a wholly-owned subsidiary), it is appropriate to use the average of a proxy group of similar risk gas pipeline companies whose common stocks are actively traded. As we will demonstrate, our selection process results in a group of domestic, non-utility firms that is comparable in total risk, the sum of business and financial risk, which reflects both non-diversifiable systematic, or market, risk as well as diversifiable unsystematic, or firm-specific, risk.

## Embedded in the Landmark Decisions

As stated in *Bluefield* in 1922: "A public utility is entitled to such rates as will permit it to earn a return ... on investments in other business undertakings which are attended by corresponding risks and uncertainties ..."

In addition, the court stated in *Hope* in 1944: "By that standard the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks."

Thus, the "corresponding risk" precept of *Bluefield* and *Hope* predates the use of such market-based cost-of-equity models as the Discounted Cash Flow (DCF) and Capital Asset Pricing (CAPM), which were developed later and are currently popular in rate-base/rate-of-return regulation. Consequently, the comparable earnings model has a longer regulatory and judicial history. However, it has far greater relevance now than ever before in its history because significant deregulation has substantially increased natural gas utilities' investment risk to a level similar to that of non-utility firms. As a result, it is

# Comparable Earnings *from page 4*

more important than ever to look to similar-risk non-utility firms for insight into common equity cost rate, especially in view of the deficiencies inherent in the currently popular market-based cost of common equity models, particularly the DCF model.

Despite the fact that the landmark decisions are still regarded as having set the standards for determining a fair rate of return, the comparable earnings model has experienced decreased usage by expert witnesses, as well as less regulatory acceptance over the years. We believe the decline in the popularity of the comparable earnings model, in large measure, is attributable to the difficulty of selecting non-utility proxy firms that regulators will accept as comparable to the target utility. Regulatory acceptance is difficult to gain when the selection process is arbitrary. Our application of the model is objective and consistent with fundamental financial tenets.

## Principles of Comparable Earnings

Regulation is a substitute for the competition of the marketplace. Moreover, regulated public utilities compete in the capital markets with all firms, including unregulated non-utilities. The comparable earnings model is based upon the opportunity cost principle; i.e., that the true cost of an investment is the return that could have been earned on the next best available alternative investment of similar risk. Consequently, the comparable earnings model is consistent with regulatory and financial principles, as it is a surrogate for the competition of the marketplace, and investors seek the greatest available rate of return for bearing similar risk.

The selection of comparable firms is the most difficult step in applying the comparable earnings model, as noted by Phillips[2] as well as by Bonbright, Danielsen and Kamerschen.[3] The selection of non-utility proxy firms should result in a sufficiently broad-based group in order to minimize the effect of company-specific aberrations. However, if the selection process is arbitrary, it likely would result in a proxy group that is too broad-based, such as the Standard & Poor's 500 Composite Index or the Value Line Industrial Composite. The use of such groups would require subjective adjustments to the comparable earnings results to reflect risk differences between the group(s) and the target utility, a gas pipeline company in this example.

## Authors' Selection Criteria

We base the selection of comparable non-utility firms on market-based, objective, quantitative measures of risk resulting from market prices that subsume investors' assessments of all elements of risk. Thus, our approach is based upon the principle of risk and return; namely, that firms of comparable risk should be expected to earn comparable returns. It is also consistent with the "corresponding risk" standard established in *Bluefield* and *Hope*. We measure total investment risk as the sum of non-diversifiable systematic and diversifiable unsystematic risk. We use the unadjusted beta as a measure of systematic risk and the standard error of the estimate (residual standard error) as a measure of unsystematic risk. Both the unadjusted beta and the residual standard error are derived from a regression of the target utility's security returns relative to the market's returns, which takes the general form:

$r_{it} = a_i + b_i r_{mt} + e_{it}$

where:

- $r_{it}$ = $t$th observation of the $i$th utility's rate of return
- $r_{mt}$ = $t$th observation of the market's rate of return
- $e_{it}$ = $t$th random error term
- $a_i$ = constant least-squares regression coefficient
- $b_i$ = least-squares regression slope coefficient, the unadjusted beta.

As shown by Francis,[4] the total variation or risk of a firm's return, Var ($r_i$), comes from two sources:

Var ($r_i$) = total risk of $i$th asset
= var($a_i + b_i r_m + e$)
substituting ($a_i + b_i r_m + e$) for $r_i$
= var($b_i r_m$) + var ($e$) since var($a_i$) = 0
= $b_i^2$ var($r_m$) + var ($e$) since var($b_i r_m$) = $b_i^2$ var($r_m$)
= systematic + unsystematic risk

Francis[5] also notes: "The term $\sigma^2(r_i|r_m)$ is called the *residual variance around the regression line* in statistical terms or *unsystematic risk* in capital market theory language. $\sigma^2 (r_i|r_m)$ = ... = var ($e$). The residual variance is the squared standard error in regression language, a measure of unsystematic risk." Application of these criteria results in a group of non-utility firms whose average total investment risk is indeed comparable to that of the target gas pipeline.

As a measure of systematic risk, we use the Value Line unadjusted beta. Beta measures the extent to which market-wide or macro-economic events affect a firm's stock price. We use the unadjusted beta of the target utility as a starting point because it results from the regression of the target utility's security returns relative to the market's returns. Thus, the resulting standard deviation of beta relates to the unadjusted beta. We use the standard deviation of the unadjusted beta to determine the range around it as the selection criterion based on systematic risk.

We use the residual standard error of the regression as a measure of unsystematic risk. The residual standard error reflects the extent to which events specific to the firm's operations affect a firm's stock price. Thus, it is a measure of diversifiable, unsystematic, firm-specific risk.

## An Illustration of Authors' Approach

**Step One:** We begin our approach by establishing the selection criteria as a range of both unadjusted beta and residual standard error of the target gas

*continued on page 6*

# Comparable Earnings *from page 5*

pipeline company.

As shown in table 1, our target gas pipeline company has a Value Line unadjusted beta of 0.90, whose standard deviation is 0.1250. The selection criterion range of unadjusted beta is the unadjusted beta plus (+) and minus (-) three of its standard deviations. By using three standard deviations, 99.73 percent of the comparable unadjusted betas is captured.

Three standard deviations of the target utility's unadjusted beta equals 0.38 (0.1250 x 3 = 0.3750, rounded to 0.38). Consequently, the range of unadjusted betas to be used as a selection criteria is 0.52 - 1.28 (0.52 = 0.90 - 0.38) and (1.28 = 0.90 + 0.38).

Likewise, the selection criterion range of residual standard error equals the residual standard error plus (+) and minus (-) three of its standard deviations. The standard deviation of the residual standard error is defined as: $\sigma/\sqrt{2N}$.

As also shown in table 1, the target gas pipeline company has a residual standard error of 3.7867. According to the above formula, the standard deviation of the residual standard error would be 0.1664 ($0.1664 = 3.7867/\sqrt{2(259)} = 3.7867/22.7596$, where 259 = N, the number of weekly price change observations over a period of five years). Three standard deviations of the target utility's residual standard error would be 0.4992 (0.1664 x 3 = .4992). Consequently, the range of residual standard errors to be used as a selection criterion is 3.2875 - 4.2859 (3.2875 = 3.7867 - 0.4992) and (4.2859 = 3.7867 + 0.4992).

**Step Two:** The step one criteria are applied to Value Line's data base of nearly 4,000 firms for which Value Line derives unadjusted betas and residual standard errors on a weekly basis. All firms with unadjusted betas and residual standard errors within the criteria ranges are then selected.

**Step Three:** In the regulatory ratemaking environment, authorized common equity return rates are applied to a book-value rate base. Thus, the earnings rates on book common equity, or net worth, of competitive, non-utility firms are highly relevant provided those firms are indeed comparable in total risk to the target gas pipeline. The use of the return rates of other utilities has no relevance because their allowed, and hence subsequently achieved, earnings rates are dependent upon the regulatory

table 1

## Summary of the Comparable Earnings Analysis for the Proxy Group of 248 Non-Utility Companies Comparable in Total Risk to the Target Gas Pipeline Company[1]

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | | | residual | rate of return on net worth | | | | |
| | adj. beta | unadj. beta | standard error | 3-year average[2] | 4-year average[2] | 5-year average[2] | 5-year projected[3] | |
| average for the proxy group of 248 non-utility companies comparable in total risk to the target gas pipeline company | 0.97 | 0.92 | 3.7705 | | | | | |
| target gas pipeline company | 0.96 | 0.90[4] | 3.7867 | | | | | |
| median | | | | 11.7% | 12.0% | 12.6% | 15.5% | |
| average of the median historical returns | | | | | 12.1% | | | |
| conclusion[5] | | | | | | | | 13.8% |

[1]The criteria for selection of the non-utility group was that the non-utility companies be domestic and included in *Value Line Investment Survey*. The non-utility group was selected based on an unadjusted beta range of 0.52 to 1.28 and a residual standard error range of 3.2875 to 4.2859.
[2]Ending 1992.
[3]1996-1998/1997-1999.
[4]The average standard deviation of the target gas pipeline company's unadjusted beta is 0.1250.
[5]Equal weight given to both the average of the 3-, 4- and 5-year historical medians (12.1%) and 5-year projected median rate of return on net worth (15.5%). Thus, 13.8% = (12.1% + 15.5% / 2).
Source: Value Line Inc., March 15, 1994
*Value Line Investment Survey*

# Comparable Earnings *from page 6*

process. Consequently, we believe all utilities must be eliminated to avoid circularity. Moreover, we believe non-domestic firms must be eliminated because their reporting methods differ significantly from U.S. firms.

**Step Four:** We then eliminated those firms for which Value Line does not publish a "Ratings & Report" in *Value Line Investment Survey* so that the historical and projected returns on net worth[6] are from a consistent source. We use historical returns on net worth for the most recent five years, as well as those projected three to five years into the future. We believe it is logical to evaluate both historical and projected return rates because it is reasonable to assume that investors avail themselves of both when they are available from widely disseminated information services, such as Value Line Inc. The use of Value Line's return rates on net worth understates the common equity return rates for two reasons. First, preferred stock is included in net worth. Second, the net worth return rates are as of the end of each period. Thus, the use of average common equity return rates would yield higher results.

**Step Five:** Median returns based on the historical average three, four and five years ending 1992 and projected 1996-1998 or 1997-1999 rates of return on net worth are then determined as shown in columns 4 through 7 of table 1. The median is used due to the wide variations and skewness in rates of return on net worth for the non-utility firms as evidenced by the frequency distributions of those returns as shown in illustration 1.

However, we show the average unadjusted beta, 0.92, and residual standard error, 3.7705, for the proxy group in columns 2 and 3 of table 1 because their frequency distributions are not significantly skewed, as shown in illustration 2.

**Step Six:** Our conclusion of a com-

*continued on page 8*

Illustration 1

**Rates of Return on Net Worth for the Proxy Group of 248 Non-Utility Companies[1]**

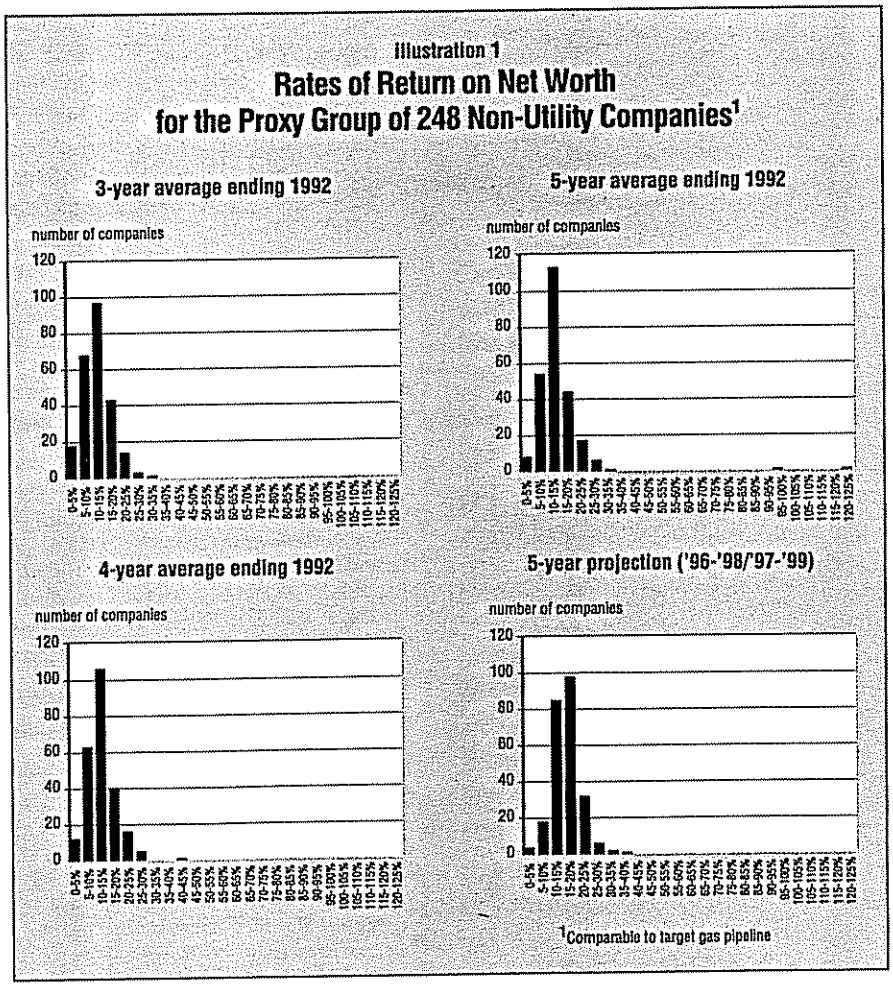
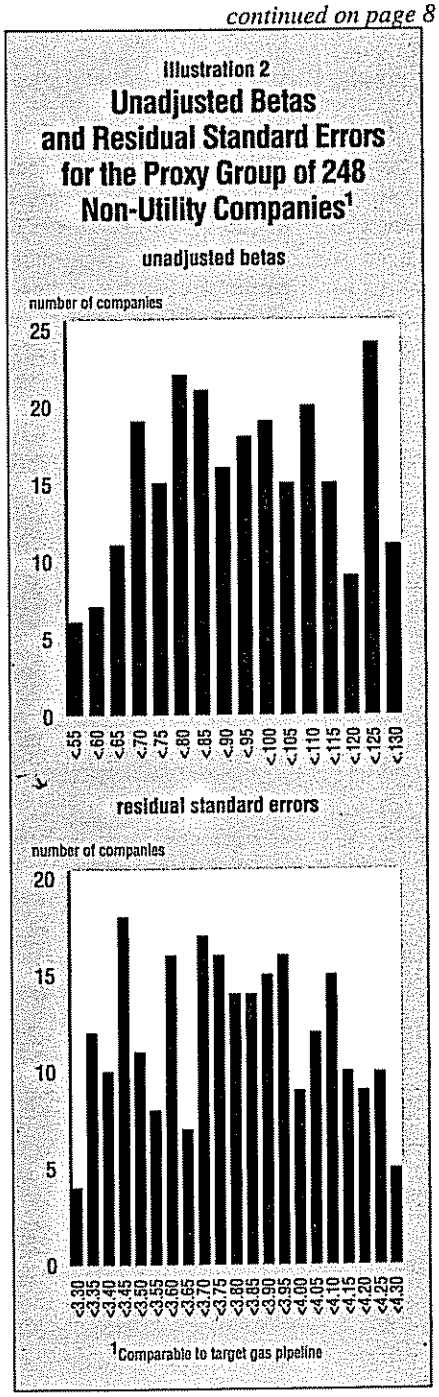



Illustration 2

**Unadjusted Betas and Residual Standard Errors for the Proxy Group of 248 Non-Utility Companies[1]**



# Comparable Earnings *from page 7*

parable earnings cost rate is based upon the mid-point of the average of the median three-, four- and five-year historical rates of return on net worth of 12.1 percent as shown in column 5 and the median projected 1996-1998/1997-1999 rate of return on net worth of 15.5 percent as shown in column 7 of table 1. As shown in column 8, it is 13.8 percent.

## Summary

Our comparable earnings approach demonstrates that it is possible to select a proxy group of non-utility firms that is comparable in total risk to a target utility. In our example, the 13.8 percent comparable earnings cost rate is very conservative as it is an expected achieved rate on book common equity (a regulatory allowed rate should be greater) and because it is based on end-of-period net worth. A similar rate on average net worth would be about 20 to 40 basis points higher (i.e., 14.0 to 14.2 percent) and still understate the appropriate regulatory allowed rate of return on book common equity.

Our selection criteria are based upon measures of systematic and unsystematic risk, specifically unadjusted beta and residual standard error. They provide the basis for the objective selection of comparable non-utility firms. Our selection criteria rely on changes in market prices over approximately five years. We compare the aggregate total risk, or the sum of systematic and unsystematic risk, which reflects investors' aggregate assessment of both business and financial risk. Thus, no adjustments are necessary to the proxy group results to compensate for the differences in business risk and financial risk, such as accounting practices and debt/equity ratios. Moreover, it is inappropriate to attempt a comparison of the target utility with any individual firm, or subset of firms, in the proxy group because only the average firm of the group is relevant.

Because the comparable earnings model is firmly anchored in the "corresponding risk" precept established in the landmark court decisions, it is worthy of consideration as a principal model for use in estimating the cost rate of common equity capital of a regulated utility. Our approach to the comparable earnings model produces a proxy group that is indeed comparable in total risk because the selection process is objective and quantitative. It therefore overcomes criticism linked to arbitrary selection processes.

All cost-of-common-equity models, including the DCF and CAPM, are fraught with deficiencies, usually stemming from the many necessary but unrealistic assumptions that underlie them. The effects of the deficiencies of individual models can be mitigated by using more than one model when estimating a utility's common equity cost rate. Therefore, when the non-comparability issue is overcome, the comparable earnings model deserves to receive the same consideration as a primary model, as do the currently popular market-based models. ■

[1] *Bluefield Water Works Improvement Co. v. Public Service Commission*. 262 U.S. 679 (1922) and *Federal Power Commission v. Hope Natural Gas Co.* 320 U.S. 519 (1944).

[2] Charles F. Phillips Jr., The Regulation of Public Utilities: Theory and Practice. Public Utilities Reports Inc. 1988. p. 379.

[3] James C. Bonbright, Albert L. Danielsen and David R. Kamerschen. Principles of Public Utilities Rates. 2nd edition. Public Utilities Reports Inc. 1988, p. 329.

[4] Jack Clark Francis, Investments: Analysis and Management, 3rd edition. McGraw-Hill Book Co., 1980, p. 363.

[5] Id., p. 548.

[6] Returns on net worth must be used when relying on Value Line data because returns on book common equity for non-utility firms are not available from Value Line.

## Report Lists Pipeline, Storage Projects

More than $9 billion worth of projects to expand the nation's natural gas pipeline network are in various stages of development, according to an A.G.A. report. These projects involve nearly 8,000 miles of new pipelines and capacity additions to existing lines and represent 15.3 billion cubic feet (Bcf) per day of new pipeline capacity.

During 1993 and early 1994, construction on 3,100 miles of pipeline was completed or under way, at a cost of nearly $4 billion, says A.G.A. These projects are adding 5.4 Bcf in daily delivery capacity nationwide.

Among the projects completed in 1993 were Pacific Gas Transmission Co.'s 805 miles of looping that allows increased deliveries of Canadian gas to the West Coast; Northwest Pipeline Corp.'s addition of 433 million cubic feet of daily capacity for customers in the Pacific Northwest and Rocky Mountain areas; and the 156-mile Empire State Pipeline in New York.

In addition, major construction projects were started on the systems of Texas Eastern Transmission Corp. and Algonquin Gas Transmission Co. — both subsidiaries of Panhandle Eastern Corp. — and along Florida Gas Transmission Co.'s pipeline.

The report goes on to discuss another $5 billion in proposed projects, which, if completed, will add nearly 5,000 miles of pipeline and 9.8 Bcf per day in capacity, much of it serving Florida and West Coast markets.

A.G.A. also identifies 47 storage projects and says that if all of them are built, existing storage capacity will increase by more than 500 Bcf, or 15 percent.

For a copy of *New Pipeline Construction: Status Report 1993-94* (#F00103), call A.G.A. at (703) 841-8490. Price per copy is $6 for employees of member companies and associates and $12 for other customers.

United Water Rhode Island, Inc.
Summary of Cost of Equity Models Applied to the
Proxy Group of Non-Utility Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Principal Methods | Proxy Group of Seventy-Six Non-Utility Companies |
|---|---|
| Discounted Cash Flow Model (DCF) (1) | 12.32 % |
| Risk Premium Model (RPM) (2) | 12.75 |
| Capital Asset Pricing Model (CAPM) (3) | 11.96 |
| Average | 12.34 % |

Notes:
(1) From page 7 of this Schedule.
(2) From page 8 of this Schedule.
(3) From page 13 of this Schedule.

United Water Rhode Island, Inc.
Basis of Selection of Comparable Risk
Domestic Non-Price Regulated Companies

| Proxy Group of Nine Water Companies | Value Line Adjusted Beta | Unadjusted Beta | Residual Standard Error of the Regression |
|---|---|---|---|
| American States Water Co. | 0.75 | 0.56 | 3.6000 |
| American Water Works Co., Inc. | 0.65 | 0.45 | 3.4198 |
| Aqua America, Inc. | 0.65 | 0.41 | 2.6979 |
| Artesian Resources Corp. | 0.60 | 0.33 | 2.5173 |
| California Water Service Group | 0.70 | 0.48 | 3.3826 |
| Connecticut Water Service, Inc. | 0.80 | 0.62 | 2.7346 |
| Middlesex Water Company | 0.75 | 0.55 | 2.6885 |
| SJW Corporation | 0.90 | 0.81 | 4.2824 |
| York Water Company | 0.70 | 0.48 | 3.1887 |
| Average | 0.72 | 0.52 | 3.1680 |
| | | | |
| Beta Range (+/- 3 std. Devs. of Beta) | 0.32 | 0.72 | |
| 3 std. Devs. of Beta | 0.20 | | |
| | | | |
| Residual Std. Err. Range (+/- 3 std. Devs. of the Residual Std. Err.) | 2.7504 | 3.5856 | |
| | | | |
| Std. dev. of the Res. Std. Err. | 0.1392 | | |
| | | | |
| 3 std. devs. of the Res. Std. Err. | 0.4176 | | |

United Water Rhode Island, Inc.
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | VL Adjusted Beta | Unadjusted Beta | Residual Standard Error of the Regression |
|---|---|---|---|
| Gallagher (Arthur J.) | 0.70 | 0.53 | 3.0037 |
| Amgen | 0.65 | 0.43 | 3.5251 |
| AutoZone Inc. | 0.70 | 0.53 | 3.3180 |
| Baxter Intl Inc. | 0.65 | 0.46 | 2.9109 |
| Bristol-Myers Squibb | 0.75 | 0.58 | 2.8963 |
| Brown & Brown | 0.70 | 0.47 | 3.0782 |
| CACI Intl | 0.80 | 0.67 | 3.5529 |
| ConAgra Foods | 0.65 | 0.42 | 2.7584 |
| Cardinal Health | 0.80 | 0.67 | 3.4062 |
| Cephalon Inc. | 0.70 | 0.49 | 3.5640 |
| Capitol Fed. Finl | 0.65 | 0.43 | 3.3021 |
| Cullen/Frost Bankers | 0.85 | 0.72 | 2.8384 |
| Costco Wholesale | 0.75 | 0.58 | 2.7602 |
| CenturyLink Inc. | 0.75 | 0.55 | 2.9979 |
| CVS Caremark Corp. | 0.80 | 0.66 | 2.9829 |
| Quest Diagnostics | 0.70 | 0.50 | 2.9759 |
| DaVita Inc. | 0.60 | 0.39 | 2.8529 |
| EarthLink, Inc. | 0.65 | 0.45 | 3.4852 |
| Energy Transfer | 0.80 | 0.67 | 3.0708 |
| Edwards Lifesciences | 0.65 | 0.42 | 3.3383 |
| First Niagara Finl Group | 0.85 | 0.71 | 3.5746 |
| Forest Labs. | 0.80 | 0.63 | 3.2403 |
| Gilead Sciences | 0.65 | 0.46 | 3.4798 |
| Gen-Probe | 0.80 | 0.65 | 3.3900 |
| Haemonetics Corp. | 0.60 | 0.39 | 2.9040 |
| Hasbro, Inc. | 0.75 | 0.61 | 3.4948 |
| Hudson City Bancorp | 0.80 | 0.67 | 3.2419 |
| HCC Insurance Hldgs. | 0.80 | 0.69 | 2.8073 |
| Hospira Inc. | 0.70 | 0.52 | 3.1915 |
| Hershey Co. | 0.65 | 0.43 | 2.8155 |
| Heartland Express | 0.80 | 0.65 | 3.5643 |
| IAC/InterActiveCorp | 0.70 | 0.48 | 3.2717 |
| Investors Bancorp | 0.75 | 0.55 | 3.4123 |
| J&J Snack Foods | 0.70 | 0.49 | 3.4392 |
| Kroger Co. | 0.60 | 0.38 | 3.0840 |
| Lancaster Colony | 0.75 | 0.57 | 3.3777 |
| Life Technologies | 0.85 | 0.72 | 3.4327 |
| McKesson Corp. | 0.75 | 0.57 | 3.3031 |
| Mercury General | 0.70 | 0.52 | 2.9569 |
| Medtronic, Inc. | 0.85 | 0.70 | 3.3449 |
| Marsh & McLennan | 0.75 | 0.60 | 2.9522 |
| MAXIMUS Inc. | 0.80 | 0.63 | 3.1773 |
| Microsoft Corp. | 0.85 | 0.70 | 2.8942 |
| Annaly Capital Mgmt. | 0.70 | 0.48 | 3.5671 |
| Northrop Grumman | 0.85 | 0.72 | 2.9442 |
| Northwest Bancshares | 0.75 | 0.61 | 3.2643 |
| Owens & Minor | 0.65 | 0.46 | 3.3954 |
| OReilly Automotive | 0.80 | 0.63 | 3.4308 |
| Peoples United Finl | 0.65 | 0.40 | 3.0327 |
| Philip Morris Intl | 0.75 | 0.57 | 2.8183 |
| Reynolds American | 0.60 | 0.33 | 2.8936 |
| Ruddick Corp. | 0.65 | 0.41 | 3.5050 |
| RLI Corp. | 0.80 | 0.64 | 2.8371 |
| Rollins, Inc. | 0.80 | 0.68 | 3.0392 |
| Sherwin-Williams | 0.70 | 0.49 | 3.0580 |
| Smucker (J.M.) | 0.70 | 0.48 | 2.9641 |

United Water Rhode Island, Inc.
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | VL Adjusted Beta | Unadjusted Beta | Residual Standard Error of the Regression |
|---|---|---|---|
| Sara Lee Corp. | 0.80 | 0.65 | 3.2417 |
| Silgan Holdings | 0.80 | 0.62 | 3.1409 |
| Synopsys, Inc. | 0.85 | 0.72 | 2.8110 |
| Suburban Propane | 0.75 | 0.61 | 2.9525 |
| Stericycle Inc. | 0.70 | 0.50 | 3.2018 |
| Safeway Inc. | 0.70 | 0.49 | 3.3748 |
| Stryker Corp. | 0.80 | 0.67 | 3.1602 |
| Molson Coors Brewing | 0.60 | 0.38 | 3.4479 |
| Teleflex Inc. | 0.80 | 0.68 | 3.1890 |
| Hanover Insurance | 0.80 | 0.69 | 2.7584 |
| TJX Companies | 0.80 | 0.66 | 2.9572 |
| Varian Medical Sys. | 0.80 | 0.68 | 3.5670 |
| Walgreen Co. | 0.75 | 0.62 | 3.2391 |
| WD-40 Co. | 0.75 | 0.55 | 3.5630 |
| Weis Markets | 0.65 | 0.45 | 2.9580 |
| Watson Pharmac. | 0.75 | 0.58 | 2.9974 |
| Berkley (W.R.) | 0.70 | 0.49 | 2.9596 |
| West Pharmac. Svcs. | 0.80 | 0.66 | 3.2917 |
| World Wrestling Ent. | 0.80 | 0.66 | 3.5148 |
| Alleghany Corp. | 0.80 | 0.65 | 3.2027 |
| Average | 0.74 | 0.56 | 3.1743 |
| Proxy Group of Nine Water Companies | 0.72 | 0.52 | 3.1680 |

United Water Rhode Island, Inc.
Basis of Selection of Group of Domestic, Non-Price Regulated Companies
Comparable in Total Risk to the Proxy Group of Nine Water Companies

(1) The criteria for selection of the proxy group of seventy-six non-utility companies was that the non-utility companies be domestic and have a meaningful projected rate of return on book common equity, shareholder's equity, net worth or partner's capital for the years 2014-2016, as reported in Value Line Investment Survey (Standard Edition). The proxy group of seventy-six non-utility companies was selected based upon the proxy group of nine water companies unadjusted beta range of 0.32 – 0.72 and standard error of the regression range of 2.7504 – 3.5856. These ranges are based upon plus or minus three standard deviations of the unadjusted beta and standard error of the regression as detailed in Ms. Ahern's direct testimony. Plus or minus three standard deviations captures 99.73% of the distribution of unadjusted betas and standard errors of the regression.

(2) The standard deviation of group of nine water companies' standard error of the regression is 0.1392. The standard deviation of the standard error of the regression is calculated as follows:

$$\text{Standard Deviation of the Std. Err. of the Regr.} = \frac{\text{Standard Error of the Regression}}{\sqrt{2N}}$$

where: N = number of observations. Since Value Line betas are derived from weekly price change observations over a period of five years, N = 259

$$\text{Thus, } 0.1392 = \frac{3.1680}{\sqrt{518}} = \frac{3.1680}{22.7596}$$

Source of Information: Value Line, Inc., September 15, 2011
Value Line Investment Survey (Standard Edition)

United Water Rhode Island, Inc.
DCF Results for the Proxy Group of Non-Utility Companies Comparable in Total Risk to
the Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | Average Dividend Yield | Value Line Projected Five Year Growth in EPS | Reuters Mean Consensus Projected Five Year Growth Rate in EPS | Zack's Five Year Projected Growth Rate in EPS | Yahoo! Finance Projected Five Year Growth in EPS | Average Projected Five Year Growth Rate in EPS | Adjusted Dividend Yield | Indicated Common Equity Cost Rate |
|---|---|---|---|---|---|---|---|---|
| Gallagher (Arthur J.) | 4.90 % | 8.50 % | 9.20 % | 9.80 % | 9.17 % | 9.17 % | 5.13 % | 14.30 % |
| Amgen | - | 7.50 | 7.00 | 8.80 | 7.53 | 7.71 | - | NA |
| AutoZone Inc. | - | 15.50 | 15.00 | 15.00 | 15.11 | 15.15 | - | NA |
| Baxter Intl Inc. | 2.27 | 9.50 | 9.00 | 9.30 | 9.50 | 9.33 | 2.38 | 11.71 |
| Bristol-Myers Squibb | 4.47 | 8.00 | 1.00 | 1.70 | 0.56 | 2.82 | 4.53 | 7.35 |
| Brown & Brown | 1.65 | 7.00 | 11.00 | 13.30 | 10.75 | 10.51 | 1.74 | 12.25 |
| CACI Intl | - | 15.00 | 13.00 | 14.50 | 13.47 | 13.99 | - | NA |
| ConAgra Foods | 3.79 | 9.50 | 7.10 | 8.00 | 7.14 | 7.94 | 3.94 | 11.88 |
| Cardinal Health | 2.08 | 9.50 | 11.00 | 11.80 | 11.30 | 10.90 | 2.19 | 13.09 |
| Cephalon Inc. | - | 13.50 | NA | NA | NA | 13.50 | - | NA |
| Capitol Fed. Finl | 2.77 | 8.00 | 3.00 | 3.00 | 3.00 | 4.25 | 2.83 | 7.08 |
| Cullen/Frost Bankers | 3.79 | 5.00 | 8.20 | 8.00 | 8.28 | 7.37 | 3.93 | 11.30 |
| Costco Wholesale | 1.21 | 9.00 | 13.00 | 13.20 | 13.34 | 12.14 | 1.29 | 13.43 |
| CenturyLink Inc. | 8.53 | (2.00) | 4.60 | NA | 21.10 | 12.85 | 9.08 | 21.93 |
| CVS Caremark Corp. | 1.44 | 8.00 | 10.00 | 11.70 | 10.35 | 10.01 | 1.51 | 11.52 |
| Quest Diagnostics | 0.82 | 8.00 | 11.00 | 11.70 | 11.21 | 10.48 | 0.86 | 11.34 |
| DaVita Inc. | - | 12.00 | 13.00 | 12.40 | 12.78 | 12.55 | - | NA |
| EarthLink, Inc. | 2.82 | (5.50) | 15.00 | 3.00 | 9.00 | 9.00 | 2.94 | 11.94 |
| Energy Transfer | 8.20 | (0.50) | 18.00 | 23.40 | 20.54 | 20.65 | 9.05 | 29.70 |
| Edwards Lifesciences | - | 15.00 | 27.00 | 20.60 | 27.84 | 22.61 | - | NA |
| First Niagara Finl Group | 6.23 | 16.00 | 15.00 | 8.00 | 12.00 | 12.75 | 6.63 | 19.38 |
| Forest Labs. | - | NMF | 0.80 | NA | (0.34) | 0.80 | - | NA |
| Gilead Sciences | - | 7.50 | 15.00 | 14.50 | 15.43 | 13.11 | - | NA |
| Gen-Probe | - | 11.00 | 12.00 | 13.80 | 12.14 | 12.24 | - | NA |
| Haemonetics Corp. | - | 11.00 | 12.00 | 12.70 | 12.25 | 11.99 | - | NA |
| Hasbro, Inc. | 3.32 | 10.50 | 11.00 | NA | 15.50 | 12.33 | 3.53 | 15.86 |
| Hudson City Bancorp | 5.18 | 2.00 | 4.50 | 4.50 | 5.00 | 4.00 | 5.28 | 9.28 |
| HCC Insurance Hldgs. | 2.09 | 6.50 | 7.80 | 8.50 | 5.67 | 7.12 | 2.17 | 9.29 |
| Hospira Inc. | - | 11.50 | 10.00 | 9.50 | 10.17 | 10.29 | - | NA |
| Hershey Co. | 2.40 | 10.50 | 7.30 | 7.50 | 7.60 | 8.23 | 2.49 | 10.72 |
| Heartland Express | 0.56 | 11.50 | 8.50 | 14.40 | 15.07 | 12.37 | 0.60 | 12.97 |
| IAC/InterActiveCorp | - | 31.00 | 35.00 | 34.20 | 43.90 | 36.03 | - | NA |
| Investors Bancorp | - | NMF | 15.00 | 15.00 | 15.00 | 15.00 | - | NA |
| J&J Snack Foods | 0.97 | 10.50 | NA | NA | NA | 10.50 | 1.02 | 11.52 |
| Kroger Co. | 1.84 | 8.00 | 10.00 | 9.70 | 10.61 | 9.58 | 1.93 | 11.51 |
| Lancaster Colony | 2.23 | 6.00 | NA | NA | 10.00 | 8.00 | 2.32 | 10.32 |
| Life Technologies | - | NMF | 9.80 | 9.00 | 9.54 | 9.45 | - | NA |
| McKesson Corp. | 1.06 | 9.50 | 11.00 | 11.80 | 12.85 | 11.29 | 1.12 | 12.41 |
| Mercury General | 6.37 | 10.00 | 7.70 | 6.50 | 5.10 | 7.33 | 6.60 | 13.93 |
| Medtronic, Inc. | 2.71 | 5.50 | 7.00 | 7.60 | 6.56 | 6.67 | 2.80 | 9.47 |
| Marsh & McLennan | 3.01 | 28.50 | 9.60 | 10.70 | 9.94 | 14.69 | 3.23 | 17.92 |
| MAXIMUS Inc. | 0.82 | 18.50 | 7.00 | 4.00 | 7.00 | 9.13 | 0.86 | 9.99 |
| Microsoft Corp. | 2.47 | 12.00 | 11.00 | 11.10 | 9.90 | 11.00 | 2.60 | 13.60 |
| Annaly Capital Mgmt. | 15.46 | (3.50) | 0.70 | 2.00 | 1.82 | 1.51 | 15.57 | 17.08 |
| Northrop Grumman | 3.74 | 7.00 | 7.90 | 11.40 | 7.88 | 8.55 | 3.90 | 12.45 |
| Northwest Bancshares | 3.71 | 15.50 | 5.00 | 5.00 | 5.00 | 7.63 | 3.85 | 11.48 |
| Owens & Minor | 2.77 | 10.00 | 9.70 | 11.50 | 9.77 | 10.24 | 2.91 | 13.15 |
| OReilly Automotive | - | 13.50 | 16.00 | 15.70 | 16.50 | 15.43 | - | NA |
| Peoples United Finl | 5.40 | 21.00 | 21.00 | 7.70 | 21.02 | 17.68 | 5.87 | 23.55 |
| Philip Morris Intl | 3.83 | 8.00 | 11.00 | 10.00 | 12.35 | 10.34 | 4.03 | 14.37 |
| Reynolds American | 5.82 | 4.50 | 8.00 | 6.00 | 8.00 | 6.63 | 6.02 | 12.65 |
| Ruddick Corp. | 1.30 | 8.50 | 12.00 | 12.00 | 12.00 | 11.13 | 1.37 | 12.50 |
| RLI Corp. | 1.91 | 3.00 | 11.00 | 12.70 | 12.50 | 9.80 | 2.01 | 11.81 |
| Rollins, Inc. | 1.47 | 13.50 | NA | NA | 10.00 | 11.75 | 1.55 | 13.30 |
| Sherwin-Williams | 1.95 | 11.00 | 10.00 | 10.30 | 10.00 | 10.33 | 2.05 | 12.38 |
| Smucker (J.M.) | 2.41 | 9.50 | 6.90 | 8.00 | 6.80 | 7.80 | 2.51 | 10.31 |
| Sara Lee Corp. | 2.62 | 7.50 | 8.30 | 6.00 | 9.03 | 7.71 | 2.72 | 10.43 |
| Silgan Holdings | 1.19 | 10.00 | 6.40 | 5.00 | 6.55 | 6.99 | 1.23 | 8.22 |
| Synopsys, Inc. | - | 11.00 | 8.50 | 8.50 | 8.50 | 9.13 | - | NA |

United Water Rhode Island, Inc.
DCF Results for the Proxy Group of Non-Utility Companies Comparable in Total Risk to
the Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | Average Dividend Yield | Value Line Projected Five Year Growth in EPS | Reuters Mean Consensus Projected Five Year Growth Rate in EPS | Zack's Five Year Projected Growth Rate in EPS | Yahoo! Finance Projected Five Year Growth in EPS | Average Projected Five Year Growth Rate in EPS | Adjusted Dividend Yield | Indicated Common Equity Cost Rate |
|---|---|---|---|---|---|---|---|---|
| Suburban Propane | 7.36 | 1.00 | 3.00 | 1.00 | 2.50 | 1.88 | 7.43 | 9.31 |
| Stericycle Inc. | - | 14.50 | 18.00 | 17.50 | 18.00 | 17.00 | - | NA |
| Safeway Inc. | 3.26 % | 7.00 % | 8.40 % | 10.40 % | 8.16 % | 8.49 % | 3.40 % | 11.89 % |
| Stryker Corp. | 1.49 | 9.50 | 11.00 | 10.80 | 10.52 | 10.46 | 1.57 | 12.03 |
| Molson Coors Brewing | 3.04 | 5.00 | NA | 10.00 | 12.00 | 9.00 | 3.17 | 12.17 |
| Teleflex Inc. | 2.50 | 9.00 | 12.00 | 10.50 | 13.75 | 11.31 | 2.64 | 13.95 |
| Hanover Insurance | 3.18 | 11.00 | 9.00 | 15.00 | 11.00 | 11.50 | 3.36 | 14.86 |
| TJX Companies | 1.39 | 13.50 | 12.00 | 13.90 | 12.92 | 13.08 | 1.48 | 14.56 |
| Varian Medical Sys. | - | 12.50 | 13.00 | 14.30 | 14.50 | 13.58 | - | NA |
| Walgreen Co. | 1.98 | 12.00 | 10.00 | 12.60 | 8.38 | 10.75 | 2.09 | 12.84 |
| WD-40 Co. | 2.68 | 9.50 | 12.00 | 12.00 | 12.00 | 11.38 | 2.83 | 14.21 |
| Weis Markets | 3.00 | 6.50 | NA | NA | NA | 6.50 | 3.10 | 9.60 |
| Watson Pharmac. | - | 11.50 | 11.00 | 12.30 | 11.88 | 11.67 | - | NA |
| Berkley (W.R.) | 1.08 | 11.50 | 11.00 | 11.30 | 9.50 | 10.83 | 1.14 | 11.97 |
| West Pharmac. Svcs. | 1.73 | 10.50 | 16.00 | NA | 14.10 | 13.53 | 1.85 | 15.38 |
| World Wrestling Ent. | 5.15 | 5.00 | 8.50 | 7.50 | 7.50 | 7.13 | 5.33 | 12.46 |
| Alleghany Corp. | - | 11.00 | NA | NA | NA | 11.00 | - | NA |
| Average | | | | | | | | 12.96 % |
| Median | | | | | | | | 12.32 % |

NA= Not Available
NMF= Not Meaningful Figure

(1) Ms. Ahern's application of the DCF model to the domestic, non-price regluated comparable risk companies is identical to the application of the DCF to her proxy group of water companies. She uses the 60 day average price and the spot indicated dividend as of October 18, 2011 for her dividend yield and then adjusts that yield for 1/2 the average projected growth rate in EPS, which is calculated by averaging the 5 year projected growth in EPS provided by Value Line, www.reuters.com, www.zacks.com, and www.yahoo.com (excluding any negative growth rates) and then adding that growth rate to the adjusted dividend yield.

Source of Information: Value Line Investment Survey:
www.reuters.com Downloaded on 10/19/2011
www.zacks.com Downloaded on 10/19/2011
www.yahoo.com Downloaded on 10/19/2011

United Water Rhode Island, Inc.
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

| Line No. | | Proxy Group of Seventy-Six Non-Utility Companies |
|---|---|---|
| 1. | Prospective Yield on Baa Rated Corporate Bonds (1) | 5.35 % |
| 2. | Equity Risk Premium (2) | 7.40 |
| 3. | Risk Premium Derived Common Equity Cost Rate | 12.75 % |

Notes: (1) Average forecast based upon six quarterly estimates of Baa rated corporate bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2011 (see page 3 of Schedule PMA-3 Rebuttal). The estimates are detailed below.

| | |
|---|---|
| Fourth Quarter 2011 | 5.00 % |
| First Quarter 2012 | 5.30 |
| Second Quarter 2012 | 5.30 |
| Third Quarter 2012 | 5.40 |
| Fourth Quarter 2012 | 5.50 |
| First Quarter 2013 | 5.60 |
| Average | 5.35 % |

(2) From page 11 of this Schedule.

United Water Rhode Island, Inc.
Comparison of Bond Ratings for the
Proxy Group of Non-Utility Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| | Moody's Bond Rating October 2011 | | Standard & Poor's Bond Rating October 2011 | |
|---|---|---|---|---|
| Proxy Group of Seventy-Six Non-Utility Companies | Bond Rating | Numerical Weighting (1) | Bond Rating | Numerical Weighting (1) |
| Gallagher (Arthur J.) | NR | - | NR | - |
| Amgen | A3 | 7.0 | A+ | 5.0 |
| AutoZone Inc. | Baa2 | 9.0 | BBB | 9.0 |
| Baxter Intl Inc. | A3 | 7.0 | A+ | 5.0 |
| Bristol-Myers Squibb | A2 | 6.0 | A+ | 5.0 |
| Brown & Brown | NR | - | NR | - |
| CACI Intl | NR | - | NR | - |
| ConAgra Foods | Baa2 | 9.0 | BBB | 9.0 |
| Cardinal Health | Baa3 | 10.0 | A- | 7.0 |
| Cephalon Inc. | NR | - | NR | - |
| Capitol Fed. Finl | NR | - | NR | - |
| Cullen/Frost Bankers | A1 | 5.0 | BBB+ | 8.0 |
| Costco Wholesale | A2 | 6.0 | A+ | 5.0 |
| CenturyLink Inc. | NR | - | BB | 12.0 |
| CVS Caremark Corp. | Baa2 | 9.0 | BBB+ | 8.0 |
| Quest Diagnostics | Baa2 | 9.0 | BBB+ | 8.0 |
| DaVita Inc. | Ba3 | 13.0 | B | 15.0 |
| EarthLink, Inc. | B1 | 14.0 | NR | - |
| Energy Transfer | Baa3 | 10.0 | BBB- | 10.0 |
| Edwards Lifesciences | NR | - | NR | - |
| First Niagara Finl Group | Baa2 | 9.0 | NR | - |
| Forest Labs. | NR | - | NR | - |
| Gilead Sciences | Baa1 | 8.0 | NR | - |
| Gen-Probe | NR | - | NR | - |
| Haemonetics Corp. | NR | - | NR | - |
| Hasbro, Inc. | Baa2 | 9.0 | BBB+ | 8.0 |
| Hudson City Bancorp | NR | - | NR | - |
| HCC Insurance Hldgs. | Baa1 | 8.0 | NR | - |
| Hospira Inc. | Baa3 | 10.0 | BBB+ | 8.0 |
| Hershey Co. | A2 | 6.0 | A | 6.0 |
| Heartland Express | NR | - | NR | - |
| IAC/InterActiveCorp | Ba2 | 12.0 | NR | - |
| Investors Bancorp | NR | - | NR | - |
| J&J Snack Foods | NR | - | NR | - |
| Kroger Co. | Baa2 | 8.0 | BBB | 8.0 |
| Lancaster Colony | NR | - | NR | - |
| Life Technologies | Ba1 | 11.0 | NR | - |
| McKesson Corp. | Ba2 | 12.0 | A- | 7.0 |
| Mercury General | NR | - | NR | - |
| Medtronic, Inc. | A1 | 5.0 | AA- | 4.0 |
| Marsh & McLennan | Baa2 | 9.0 | BBB- | 10.0 |
| MAXIMUS Inc. | NR | - | NR | - |
| Microsoft Corp. | Aaa | 1.0 | AAA | 1.0 |
| Annaly Capital Mgmt. | NR | - | NR | - |
| Northrop Grumman | Baa1 | 8.0 | BBB+ | 8.0 |
| Northwest Bancshares | NR | - | NR | - |
| Owens & Minor | Ba2 | 12.0 | BBB- | 10.0 |
| OReilly Automotive | NR | - | NR | - |
| Peoples United Finl | A3 | 7.0 | NR | - |
| Philip Morris Intl | A2 | 6.0 | BBB | 9.0 |
| Reynolds American | Baa3 | 10.0 | BBB- | 10.0 |

United Water Rhode Island, Inc.
Comparison of Bond Ratings for the
Proxy Group of Non-Utility Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | Moody's Bond Rating October 2011 | Moody's Numerical Weighting (1) | Standard & Poor's Bond Rating October 2011 | Standard & Poor's Numerical Weighting (1) |
|---|---|---|---|---|
| Ruddick Corp. | NR | - | NR | - |
| RLI Corp. | Baa2 | 9.0 | BBB+ | 8.0 |
| Rollins, Inc. | NR | - | NR | - |
| Sherwin-Williams | A3 | 7.0 | A | 6.0 |
| Smucker (J.M.) | NR | - | NR | - |
| Sara Lee Corp. | Baa1 | 8.0 | BBB | 9.0 |
| Silgan Holdings | Ba1 | 11.0 | NR | - |
| Synopsys, Inc. | NR | - | NR | - |
| Suburban Propane | Ba2 | 12.0 | BB- | 13.0 |
| Stericycle Inc. | NR | - | NR | - |
| Safeway Inc. | Baa2 | 9.0 | BBB | 9.0 |
| Stryker Corp. | A3 | 7.0 | NR | - |
| Molson Coors Brewing | NR | - | NR | - |
| Teleflex Inc. | Ba3 | 13.0 | NR | - |
| Hanover Insurance | Baa3 | 10.0 | BBB- | 10.0 |
| TJX Companies | A3 | 7.0 | NR | - |
| Varian Medical Sys. | NR | - | NR | - |
| Walgreen Co. | A2 | 6.0 | A | 6.0 |
| WD-40 Co. | NR | - | NR | - |
| Weis Markets | NR | - | NR | - |
| Watson Pharmac. | Baa3 | 10.0 | NR | - |
| Berkley (W.R.) | Baa2 | 9.0 | BBB+ | 8.0 |
| West Pharmac. Svcs. | NR | - | NR | - |
| World Wrestling Ent. | NR | - | NR | - |
| Alleghany Corp. | Baa2 | 9.0 | NR | - |
| Average | Baa2 | 8.7 | BBB+ | 8.0 |

Notes:
(1) From page 3 of Schedule PMA-8.

Source of Information:
Standard & Poor's Bond Guide June 2011
www.moodys.com; downloaded 10/19/2011

United Water Rhode Island, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
the Proxy Group of Non-Utility Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Line No. | | Proxy Group of Seventy-Six Non-Utility Companies |
|---|---|---|
| 1. | Arithmetic mean total return rate on the Standard & Poor's 500 Composite Index - 1926-2010 (1) | 11.90 % |
| 2. | Arithmetic mean yield on Aaa and Aa Corporate Bonds 1926-2010 (2) | (6.10) |
| 3. | Historical Equity Risk Premium | 5.80 % |
| 4. | Forecasted 3-5 year Total Annual Market Return (3) | 18.29 % |
| 5. | Prospective Yield an Aaa Rated Corporate Bonds (4) | (4.37) |
| 6. | Forecasted Equity Risk Premium | 13.92 % |
| 7. | Conclusion of Equity Risk Premium (5) | 9.86 % |
| 8. | Adjusted Value Line Beta (6) | 0.75 |
| 9. | Beta Adjusted Equity Risk Premium | 7.40 % |

Notes:
(1) Ibbotson Associates 2011 Valuation Yearbook - Market Results for 1926-2010, Morningstar, Inc., 2011 Chicago, IL.
(2) From Moody's Industrial Manual and Mergent Bond Record Monthly Update.
(3) From page 2 of Schedule PMA-3 Rebuttal.
(4) Average forecast based upon six quarterly estimates of Aaa rated corporate bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2011 (see page 3 of Schedule PMA-3 Rebuttal). The estimates are detailed below.

| | |
|---|---|
| Fourth Quarter 2011 | 4.20 % |
| First Quarter 2012 | 4.20 |
| Second Quarter 2012 | 4.30 |
| Third Quarter 2012 | 4.40 |
| Fourth Quarter 2012 | 4.50 |
| First Quarter 2013 | 4.60 |
| Average | 4.37 % |

(5) The average of the historical equity risk premium of 5.80% from Line No. 3 and the forecasted equity risk premium of 13.92% from Line No. 6 ((5.80% + 13.92%) / 2 = 9.86%.
(6) Median beta derived from pages 12-13 of this Schedule.

United Water Rhode Island, Inc.
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Utility Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | Value Line Adjusted Beta | Market Risk Premium (1) | Risk-Free Rate (2) | Traditional CAPM Cost Rate (3) | ECAPM Cost Rate (4) | Indicated Common Equity Cost Rate (5) |
|---|---|---|---|---|---|---|
| Gallagher (Arthur J.) | 0.70 | 10.70 % | 3.60 % | 11.09 % | 11.89 % | |
| Amgen | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| AutoZone Inc. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Baxter Intl Inc. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Bristol-Myers Squibb | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Brown & Brown | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| CACI Intl | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| ConAgra Foods | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Cardinal Health | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Cephalon Inc. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Capitol Fed. Finl | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Cullen/Frost Bankers | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| Costco Wholesale | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| CenturyLink Inc. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| CVS Caremark Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Quest Diagnostics | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| DaVita Inc. | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| EarthLink, Inc. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Energy Transfer | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Edwards Lifesciences | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| First Niagara Finl Group | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| Forest Labs. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Gilead Sciences | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Gen-Probe | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Haemonetics Corp. | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| Hasbro, Inc. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Hudson City Bancorp | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| HCC Insurance Hldgs. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Hospira Inc. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Hershey Co. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Heartland Express | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| IAC/InterActiveCorp | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Investors Bancorp | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| J&J Snack Foods | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Kroger Co. | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| Lancaster Colony | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Life Technologies | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| McKesson Corp. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Mercury General | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Medtronic, Inc. | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| Marsh & McLennan | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| MAXIMUS Inc. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Microsoft Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Annaly Capital Mgmt. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Northrop Grumman | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| Northwest Bancshares | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Owens & Minor | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| OReilly Automotive | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Peoples United Finl | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Philip Morris Intl | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Reynolds American | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| Ruddick Corp. | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| RLI Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Rollins, Inc. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Sherwin-Williams | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Smucker (J.M.) | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Sara Lee Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Silgan Holdings | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Synopsys, Inc. | 0.85 | 10.70 | 3.60 | 12.70 | 13.10 | |
| Suburban Propane | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Stericycle Inc. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Safeway Inc. | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| Stryker Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Molson Coors Brewing | 0.60 | 10.70 | 3.60 | 10.02 | 11.09 | |
| Teleflex Inc. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |

United Water Rhode Island, Inc.
Traditional CAPM and ECAPM Results for the Proxy Group of Non-Utility Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

| Proxy Group of Seventy-Six Non-Utility Companies | Value Line Adjusted Beta | Market Risk Premium (1) | Risk-Free Rate (2) | Traditional CAPM Cost Rate (3) | ECAPM Cost Rate (4) | Indicated Common Equity Cost Rate (5) |
|---|---|---|---|---|---|---|
| Hanover Insurance | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| TJX Companies | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Varian Medical Sys. | 0.80 | 10.70 % | 3.60 % | 12.16 % | 12.70 % | |
| Walgreen Co. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| WD-40 Co. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Weis Markets | 0.65 | 10.70 | 3.60 | 10.56 | 11.49 | |
| Watson Pharmac. | 0.75 | 10.70 | 3.60 | 11.63 | 12.29 | |
| Berkley (W.R.) | 0.70 | 10.70 | 3.60 | 11.09 | 11.89 | |
| West Pharmac. Svcs. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| World Wrestling Ent. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Alleghany Corp. | 0.80 | 10.70 | 3.60 | 12.16 | 12.70 | |
| Average | | | | 11.49 % | 12.19 % | 11.84 % |
| Median | | | | 11.63 % | 12.29 % | 11.96 % |

Notes:
(1) From Schedule PMA-3 Rebuttal, page 2, note 1.
(2) From Schedule PMA-3 Rebuttal, page 2, note 2.
(3) Derived from the model shown on Schedule PMA-3 Rebuttal, page 2, note 3.
(4) Derived from the model shown on Schedule PMA-3 Rebuttal, page 2, note 4.
(5) Average of CAPM and ECAPM cost rates.

United Water Rhode Island, Inc.
Summary of Cost of Capital and Fair Rate of Return
Based upon the Actual Capital Structure at March 31, 2011

| Type of Capital | Ratios (1) | Cost Rate | Weighted Cost Rate |
|---|---|---|---|
| Long-Term Debt | 47.53% | 6.07% (2) | 2.89% |
| Common Equity | 52.47% | 11.10% (3) | 5.82% |
| Total | 100.00% | | 8.71% |

Notes:

(1) Company-Provided.

(2) Company Response to Div. 5-3 and Division Witness Kahal's direct testimony at page 14, lines 16-20.

(3) Although current market conditions indicate that an 11.75% common equity cost rate is reasonable, the Company is maintaining its original request of 11.10% based on my originally recommended common equity cost rate.

United Water Rhode Island, Inc.
Brief Summary of Common Equity Cost Rate

| No. | Principal Methods | Proxy Group of Nine Water Companies |
|---|---|---|
| 1. | Discounted Cash Flow Model (DCF) (1) | 11.11 % |
| 2. | Risk Premium Model (RPM) (2) | 10.41 |
| 3. | Capital Asset Pricing Model (CAPM) (3) | 11.49 |
| 4. | Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4) | 13.75 |
| 5. | Indicated Common Equity Cost Rate before Adjustment for Business Risks | 11.50 % |
| 6. | Financial Risk Adjustment (5) | (0.32) |
| 7 | Business Risk Adjustment (6) | 0.55 |
| 8. | Indicated Common Equity Cost Rate | 11.73 % |
| 9. | Recommended Common Equity Cost Rate | 11.75 % |

Notes:
(1) From page 4 of this Schedule.
(2) From page 14 of this Schedule.
(3) From page 1 of Schedule PMA-3 Rebuttal.
(4) From page 2 of Schedule 12.
(5) Financial risk adjustment to reflect the financial risk of the capital structure employed by United Water Rhode Island, Inc. for rate making purposes relative to the proxy group as detailed in Ms. Ahern's direct testimony.
(6) Business risk adjustment to reflect United Water Rhode Island, Inc.'s greater business risk due to its small size relative to the proxy group as detailed in Ms. Ahern's direct testimony.

Capital Structure Based upon Total Permanent Capital for the
Proxy Group of Nine Water Companies
2006 - 2010, Inclusive

| | 2010 | 2009 | 2008 | 2007 | 2006 | 5 YEAR AVERAGE |
|---|---|---|---|---|---|---|
| American States Water Co. | | | | | | |
| Long-Term Debt | 44.30 % | 46.95 % | 46.25 % | 46.99 % | 48.61 % | 46.62 % |
| Preferred Stock | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Common Equity | 55.70 | 53.05 | 53.75 | 53.01 | 51.39 | 53.38 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| American Water Works Co., Inc. | | | | | | |
| Long-Term Debt | 56.73 % | 56.98 % | 53.75 % | 51.05 % | 46.93 % | 53.08 % |
| Preferred Stock | 0.29 | 0.30 | 0.32 | 0.31 | 0.06 | 0.26 |
| Common Equity | 42.98 | 42.72 | 45.93 | 48.64 | 53.01 | 46.66 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| Aqua America, Inc. | | | | | | |
| Long-Term Debt | 57.05 % | 56.59 % | 54.21 % | 55.88 % | 51.55 % | 55.06 % |
| Preferred Stock | 0.02 | 0.02 | 0.09 | 0.09 | 0.10 | 0.06 |
| Common Equity | 42.93 | 43.39 | 45.70 | 44.03 | 48.35 | 44.88 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| Artesian Resources Corp. | | | | | | |
| Long-Term Debt | 52.84 % | 54.12 % | 59.57 % | 52.20 % | 61.87 % | 56.12 % |
| Preferred Stock | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Common Equity | 47.16 | 45.88 | 40.43 | 47.80 | 38.13 | 43.88 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| California Water Service Group | | | | | | |
| Long-Term Debt | 52.51 % | 47.93 % | 41.88 % | 42.86 % | 43.47 % | 45.73 % |
| Preferred Stock | 0.00 | 0.00 | 0.00 | 0.51 | 0.51 | 0.20 |
| Common Equity | 47.49 | 52.07 | 58.12 | 56.63 | 56.02 | 54.07 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| Connecticut Water Service, Inc. | | | | | | |
| Long-Term Debt | 49.32 % | 50.59 % | 46.94 % | 47.76 % | 44.42 % | 47.81 % |
| Preferred Stock | 0.34 | 0.35 | 0.39 | 0.44 | 0.49 | 0.40 |
| Common Equity | 50.34 | 49.06 | 52.67 | 51.80 | 55.09 | 51.79 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| Middlesex Water Company | | | | | | |
| Long-Term Debt | 43.91 % | 47.35 % | 49.10 % | 49.48 % | 48.78 % | 47.72 % |
| Preferred Stock | 1.07 | 1.24 | 1.22 | 1.46 | 2.95 | 1.59 |
| Common Equity | 55.02 | 51.41 | 49.68 | 49.06 | 48.27 | 50.69 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| SJW Corporation | | | | | | |
| Long-Term Debt | 53.79 % | 49.52 % | 46.08 % | 47.79 % | 41.83 % | 47.80 % |
| Preferred Stock | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 |
| Common Equity | 46.21 | 50.48 | 53.92 | 52.20 | 58.16 | 52.20 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| York Water Company | | | | | | |
| Long-Term Debt | 48.28 % | 47.16 % | 55.31 % | 51.17 % | 48.82 % | 50.15 % |
| Preferred Stock | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Common Equity | 51.72 | 52.84 | 44.69 | 48.83 | 51.18 | 49.85 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |
| Proxy Group of Nine Water Companies | | | | | | |
| Long-Term Debt | 50.97 % | 50.80 % | 50.35 % | 49.46 % | 48.48 % | 50.01 % |
| Preferred Stock | 0.19 | 0.21 | 0.22 | 0.31 | 0.46 | 0.28 |
| Common Equity | 48.84 | 48.99 | 49.43 | 50.23 | 51.06 | 49.71 |
| Total Capital | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % | 100.00 % |

Source of Information
EDGAR Online's I-Metrix Database
Annual Forms 10-K

United Water Rhode Island, Inc.
Indicated Common Equity Cost Rate Using the Discounted Cash Flow Model for
the Proxy Group of Nine Water Companies

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Proxy Group of Nine Water Companies | Average Dividend Yield (1) | Value Line Projected Five Year Growth in EPS (2) | Reuters Mean Consensus Projected Five Year Growth Rate in EPS | Zack's Five Year Projected Growth Rate in EPS | Yahoo! Finance Projected Five Year Growth in EPS | Average Projected Five Year Growth in EPS (3) | Adjusted Dividend Yield (4) | Indicated Common Equity Cost Rate (5) |
| American States Water Co. | 3.30 % | 5.50 % | 7.10 % | 12.00 % | 7.15 % | 7.94 % | 3.43 % | 11.37 % |
| American Water Works Co., Inc. | 3.03 | 9.50 | 11.00 | 8.00 | 8.13 | 9.16 | 3.17 | 12.33 |
| Aqua America, Inc. | 2.90 | 10.50 | 7.20 | 8.30 | 6.37 | 8.09 | 3.02 | 11.11 |
| Artesian Resources Corp. | 4.32 | NA | 5.00 | NA | 4.00 | 4.50 | 4.42 | 8.92 |
| California Water Service Group | 3.43 | 6.00 | 6.00 | 10.00 | 10.00 | 8.00 | 3.57 | 11.57 |
| Connecticut Water Service, Inc. | 3.57 | NA | 8.00 | NA | 3.00 | 5.50 | 3.67 | 9.17 |
| Middlesex Water Company | 4.13 | 6.00 | (5.00) | NA | 3.00 | 4.50 | 4.22 | 8.72 |
| SJW Corporation | 3.07 | 7.50 | 14.00 | NA | 14.00 | 11.83 | 3.25 | 15.08 |
| York Water Company | 3.12 | NA | 6.00 | NA | 6.00 | 6.00 | 3.21 | 9.21 |
| Average | | | | | | | | 10.83 % |
| Median | | | | | | | | 11.11 % |

NA= Not Available
NMF = Not Meaningful Figure

Notes:

(1) Indicated dividend at 10/18/2011 divided by the average closing price of the last 60 trading days ending 10/18/2011 for each company.
(2) From pages 5 through 13 of this Schedule.
(3) Average of columns 2 through 5 excluding negative growth rates.
(4) This reflects a growth rate component equal to one-half the conclusion of growth rate (from column 6) x column 1 to reflect the periodic payment of dividends (Gordon Model) as opposed to the continuous payment. Thus, for American States Water Co. , 3.30% x (1+( 1/2 x 7.94%) ) = 3.43%.
(5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey: October 21, 2011
www.reuters.com Downloaded on 10/19/2011
www.zacks.com Downloaded on 10/19/2011
www.yahoo.com Downloaded on 10/19/2011

# AMER. STATES WATER NYSE-AWR

RECENT PRICE **34.49** | P/E RATIO **16.0** (Trailing: 14.9 Median: 22.0) | RELATIVE P/E RATIO **1.17** | DIV'D YLD **3.2%** | **VALUE LINE**

**TIMELINESS** 1 Raised 9/16/11
**SAFETY** 3 New 2/4/00
TECHNICAL 3 Lowered 10/21/11
**BETA** .75 (1.00 = Market)

**2014-16 PROJECTIONS**

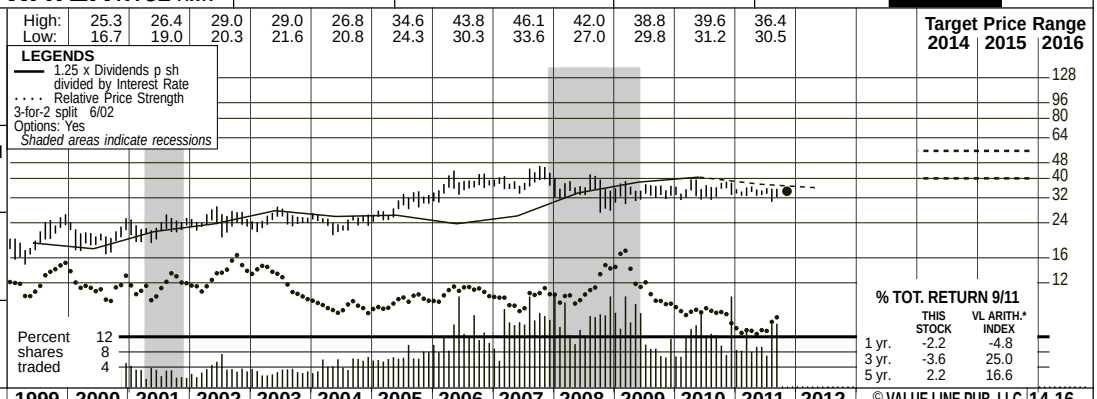
| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 55 | (+60%) | *15%* |
| Low | 40 | (+15%) | *7%* |

**Insider Decisions**

| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| to Buy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Options | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| to Sell | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 59 | 51 | 48 |
| to Sell | 51 | 48 | 55 |
| Hld's(000) | 11086 | 11214 | 11377 |




| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | © VALUE LINE PUB. LLC | 14-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11.03 | 11.37 | 11.44 | 11.02 | 12.91 | 12.17 | 13.06 | 13.78 | 13.98 | 13.61 | 14.06 | 15.76 | 17.49 | 18.42 | 19.48 | 21.41 | ***22.10*** | ***22.85*** | Revenues per sh | ***26.25*** |
| 1.75 | 1.75 | 1.85 | 2.04 | 2.26 | 2.20 | 2.53 | 2.54 | 2.08 | 2.23 | 2.64 | 2.89 | 3.31 | 3.37 | 3.40 | 4.23 | ***4.20*** | ***4.40*** | "Cash Flow" per sh | ***4.75*** |
| 1.03 | 1.13 | 1.04 | 1.08 | 1.19 | 1.28 | 1.35 | 1.34 | .78 | 1.05 | 1.32 | 1.33 | 1.62 | 1.55 | 1.62 | 2.22 | ***2.10*** | ***2.20*** | Earnings per sh A | ***2.50*** |
| .81 | .82 | .83 | .84 | .85 | .86 | .87 | .87 | .88 | .89 | .90 | .91 | .96 | 1.00 | 1.01 | 1.04 | ***1.10*** | ***1.16*** | Div'd Decl'd per sh B■ | ***1.28*** |
| 2.19 | 2.40 | 2.58 | 3.11 | 4.30 | 3.03 | 3.18 | 2.68 | 3.76 | 5.03 | 4.24 | 3.91 | 2.89 | 4.45 | 4.18 | 4.24 | ***4.00*** | ***4.15*** | Cap'l Spending per sh | ***4.75*** |
| 10.29 | 11.01 | 11.24 | 11.48 | 11.82 | 12.74 | 13.22 | 14.05 | 13.97 | 15.01 | 15.72 | 16.64 | 17.53 | 17.95 | 19.39 | 20.26 | ***20.55*** | ***20.80*** | Book Value per sh | ***20.00*** |
| 11.77 | 13.33 | 13.44 | 13.44 | 13.44 | 15.12 | 15.12 | 15.18 | 15.21 | 16.75 | 16.80 | 17.05 | 17.23 | 17.30 | 18.53 | 18.63 | ***19.00*** | ***19.25*** | Common Shs Outst'g C | ***20.00*** |
| 11.6 | 12.6 | 14.5 | 15.5 | 17.1 | 15.9 | 16.7 | 18.3 | 31.9 | 23.2 | 21.9 | 27.7 | 24.0 | 22.6 | 21.2 | 15.7 | *Bold figures are Value Line estimates* | | Avg Ann'l P/E Ratio | ***19.0*** |
| .78 | .79 | .84 | .81 | .97 | 1.03 | .86 | 1.00 | 1.82 | 1.23 | 1.17 | 1.50 | 1.27 | 1.36 | 1.41 | 1.01 | | | Relative P/E Ratio | ***1.25*** |
| 6.7% | 5.8% | 5.5% | 5.0% | 4.2% | 4.2% | 3.9% | 3.6% | 3.5% | 3.6% | 3.1% | 2.5% | 2.5% | 2.9% | 2.9% | 3.0% | | | Avg Ann'l Div'd Yield | ***2.7%*** |
| 197.5 | 209.2 | 212.7 | 228.0 | 236.2 | 268.6 | 301.4 | 318.7 | 361.0 | 398.9 | ***420*** | ***440*** | Revenues ($mill) | ***525*** |
| 20.4 | 20.3 | 11.9 | 16.5 | 22.5 | 23.1 | 28.0 | 26.8 | 29.5 | 41.4 | ***40.0*** | ***43.0*** | Net Profit ($mill) | ***50.0*** |
| 43.0% | 38.9% | 43.5% | 37.4% | 47.0% | 40.5% | 42.6% | 37.8% | 38.9% | 43.2% | ***43.0%*** | ***42.0%*** | Income Tax Rate | ***40.0%*** |
| - - | - - | - - | - - | - - | 12.2% | 8.5% | 6.9% | 3.2% | 5.8% | ***5.0%*** | ***5.0%*** | AFUDC % to Net Profit | ***5.0%*** |
| 54.9% | 52.0% | 52.0% | 47.7% | 50.4% | 48.6% | 46.9% | 46.2% | 45.9% | 44.3% | ***46.0%*** | ***46.5%*** | Long-Term Debt Ratio | ***47.0%*** |
| 44.7% | 48.0% | 48.0% | 52.3% | 49.6% | 51.4% | 53.1% | 53.8% | 54.1% | 55.7% | ***54.0%*** | ***53.5%*** | Common Equity Ratio | ***53.0%*** |
| 447.6 | 444.4 | 442.3 | 480.4 | 532.5 | 551.6 | 569.4 | 577.0 | 665.0 | 677.4 | ***690*** | ***705*** | Total Capital ($mill) | ***750*** |
| 539.8 | 563.3 | 602.3 | 664.2 | 713.2 | 750.6 | 776.4 | 825.3 | 866.4 | 855.0 | ***890*** | ***930*** | Net Plant ($mill) | ***1060*** |
| 6.1% | 6.5% | 4.6% | 5.2% | 5.4% | 6.0% | 6.7% | 6.4% | 5.9% | 7.6% | ***7.0%*** | ***7.5%*** | Return on Total Cap'l | ***8.0%*** |
| 10.1% | 9.5% | 5.6% | 6.6% | 8.5% | 8.1% | 9.3% | 8.6% | 8.2% | 11.0% | ***10.5%*** | ***11.0%*** | Return on Shr. Equity | ***12.0%*** |
| 10.1% | 9.5% | 5.6% | 6.6% | 8.5% | 8.1% | 9.3% | 8.6% | 8.2% | 11.0% | ***10.5%*** | ***10.0%*** | Return on Com Equity | ***12.0%*** |
| 3.6% | 3.3% | NMF | 1.0% | 2.8% | 2.7% | 3.9% | 3.1% | 3.2% | 5.8% | ***5.0%*** | ***5.5%*** | Retained to Com Eq | ***6.0%*** |
| 65% | 65% | 113% | 84% | 67% | 67% | 58% | 64% | 61% | 47% | ***52%*** | ***52%*** | All Div'ds to Net Prof | ***51%*** |

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $352.8 mill. **Due in 5 Yrs** $288.5 mill.
**LT Debt** $340.4 mill. **LT Interest** $27.6 mill.
(LT interest earned: 4.2x: total interest coverage: 4.0x) (46% of Cap'l)

**Leases, Uncapitalized:** Annual rentals $3.3 mill.

**Pension Assets-12/10** $90.2 mill.
**Oblig.** $118.8 mill.
**Pfd Stock** None.

**Common Stock** 18,684,812 shs.
**as of 8/5/11**
**MARKET CAP: $650 million (Small Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 1.7 | 4.2 | 11.3 |
| Other | 94.3 | 200.8 | 160.9 |
| Current Assets | 96.0 | 205.0 | 172.2 |
| Accts Payable | 33.9 | 36.2 | 58.0 |
| Debt Due | 18.1 | 61.4 | 12.4 |
| Other | 47.7 | 81.2 | 54.2 |
| Current Liab. | 99.7 | 178.8 | 124.6 |
| Fix. Chg. Cov. | 352% | 441% | *400%* |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | 5.0% | 7.5% | *4.5%* |
| "Cash Flow" | 5.5% | 9.5% | *4.5%* |
| Earnings | 4.5% | 11.5% | *5.5%* |
| Dividends | 2.0% | 2.5% | *4.0%* |
| Book Value | 5.0% | 5.0% | *2.0%* |

| Calendar | QUARTERLY REVENUES ($ mill.) Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 68.9 | 80.3 | 85.3 | 84.2 | 318.7 |
| 2009 | 79.6 | 93.6 | 101.5 | 86.3 | 361.0 |
| 2010 | 88.4 | 95.5 | 111.3 | 103.7 | 398.9 |
| 2011 | 94.3 | 109.8 | ***118.9*** | ***97.0*** | ***420*** |
| 2012 | ***98.0*** | ***115*** | ***125*** | ***102*** | ***440*** |

| Calendar | EARNINGS PER SHARE A Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .30 | .53 | .26 | .43 | 1.55 |
| 2009 | .28 | .64 | .52 | .18 | 1.62 |
| 2010 | .45 | .47 | .62 | .71 | 2.25 |
| 2011 | .37 | .68 | ***.70*** | ***.35*** | ***2.10*** |
| 2012 | ***.42*** | ***.62*** | ***.76*** | ***.40*** | ***2.20*** |

| Calendar | QUARTERLY DIVIDENDS PAID B■ Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | .235 | .235 | .235 | .250 | .96 |
| 2008 | .250 | .250 | .250 | .250 | 1.00 |
| 2009 | .250 | .250 | .250 | .260 | 1.01 |
| 2010 | .260 | .260 | .260 | .260 | 1.04 |
| 2011 | .260 | .280 | .280 | | |

**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. Sold Chaparral City Water of Arizona (6/11). Has 703 employees. Officers & directors own 2.9% of common stock (4/11 Proxy). Chairman: Lloyd Ross. President & CEO: Robert J. Sprowls. Inc: CA. Addr: 630 East Foothill Boulevard, San Dimas, CA 91773. Tel: 909-394-3600. Internet: www.aswater.com.

**American States Water does not appear to be missing the Chaparral City Water Co so far.** The water utility far surpassed expectations in the June period, the first quarter without this subsidiary in tow. Indeed, the water utility posted earnings of $0.68 a share, 45% better than the year before, on 14% revenue growth. The removal of the expenses associated with this business provided a boost, outweighing any revenue loss suffered in the sale. Rate increases, meanwhile, continue to play a role, as did business generated from the military ventures.

**The nonregulated arm is becoming a bigger piece of the puzzle.** Management has been aggressively targeting military bases of late, recognizing the benefits of making inroads in less sanctioned areas. This business is expected make more of a contribution when contract modifications are finalized. We would expect expansion here to be a catalyst.

**But the company largely remains heavily regulated, and therefore lacks significant earnings potential in our opinion.** Although the regulatory environment is improving, the guidelines set by those outside the company are stringent and capital-intensive. The costs of maintaining and distributing water is high, as old, dilapidated, systems, in some cases, require attention. The investments are costly, and will only continue to eat away at profit margins.

**The stock is ranked 1 (Highest) for Timeliness.** AWR will likely continue to do relatively well while the broader market remains in flux as we expect for the coming six to 12 months.

**That said, it loses significant luster when we look further out and account for a better economic climate.** The costs associated with doing business will probably always hang over the company, and while the income component is nice, there are more-appealing dividend-paying stocks out there. Clouding matters slightly more is American's balance sheet. Although a recent debt offering helped replenish the cash coffers a bit, additional financing activity will undoubtedly be needed looking ahead. As a result, we think that the current payout ratio may be scaled back somewhat in the years ahead.

*Andre J. Costanza* *October 21, 2011*

**(A)** Primary earnings. Excludes nonrecurring gains/(losses): '04, 14¢; '05, 25¢; '06, 6¢; '08, (27¢); '10, (44¢) '11, 20¢. Next earnings report due early November. Quarterly egs. may not add due to rounding.
**(B)** Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
**(C)** In millions, adjusted for split.

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

# AMERICAN WATER NYSE-AWK

RECENT PRICE **30.08** | P/E RATIO **16.9** (Trailing: 18.3 Median: NMF) | RELATIVE P/E RATIO **1.23** | DIV'D YLD **3.1%** | **VALUE LINE**

TIMELINESS **1** Raised 10/7/11
SAFETY **3** New 7/25/08
TECHNICAL **3** Lowered 8/26/11
BETA .65 (1.00 = Market)

**2014-16 PROJECTIONS**

| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 50 | (+65%) | *16%* |
| Low | 35 | (+15%) | *7%* |

**Insider Decisions**

| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| to Buy | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| Options | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 |
| to Sell | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 145 | 168 | 138 |
| to Sell | 119 | 117 | 145 |
| Hld's(000) | 145430 | 145932 | 145042 |

Percent shares traded: 21 / 14 / 7

LEGENDS
.... Relative Price Strength
Options: Yes
*Shaded areas indicate recessions*

High: 23.7 23.0 25.8 31.0
Low: 16.5 16.2 19.4 25.2

Target Price Range 2014 | 2015 | 2016

% TOT. RETURN 9/11

| | THIS STOCK | VL ARITH.* INDEX |
|---|---|---|
| 1 yr. | 34.1 | -4.8 |
| 3 yr. | 57.4 | 25.0 |
| 5 yr. | — | 16.6 |

| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | © VALUE LINE PUB. LLC | 14-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13.08 | 13.84 | 14.61 | 13.98 | 15.49 | ***15.85*** | ***16.55*** | Revenues per sh | ***17.95*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | .65 | d.47 | 2.87 | 2.89 | 3.56 | ***3.70*** | ***3.90*** | "Cash Flow" per sh | ***4.20*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | d.97 | d2.14 | 1.10 | 1.25 | 1.53 | ***1.75*** | ***1.90*** | Earnings per sh [A] | ***2.25*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | .40 | .82 | .86 | ***.91*** | ***.96*** | Div'd Decl'd per sh [B■] | ***1.10*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 4.31 | 4.74 | 6.31 | 4.50 | 4.38 | ***4.35*** | ***4.50*** | Cap'l Spending per sh | ***4.20*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 23.86 | 28.39 | 25.64 | 22.91 | 23.59 | ***24.50*** | ***24.05*** | Book Value per sh [D] | ***24.05*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 160.00 | 160.00 | 160.00 | 174.63 | 175.00 | ***178.00*** | ***181.00*** | Common Shs Outst'g [C] | ***190.00*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18.9 | 15.6 | 14.6 | *Bold figures are Value Line estimates* | | Avg Ann'l P/E Ratio | ***19.0*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.14 | 1.04 | .94 | | | Relative P/E Ratio | ***1.25*** |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.9% | 4.2% | 3.8% | | | Avg Ann'l Div'd Yield | ***2.8%*** |
| | | | | | | -- | -- | -- | -- | -- | 2093.1 | 2214.2 | 2336.9 | 2440.7 | 2710.7 | ***2820*** | ***3000*** | Revenues ($mill) | ***3500*** |
| | | | | | | -- | -- | -- | -- | -- | d155.8 | d342.3 | 187.2 | 209.9 | 267.8 | ***310*** | ***340*** | Net Profit ($mill) | ***415*** |
| | | | | | | -- | -- | -- | -- | -- | -- | -- | 37.4% | 37.9% | 40.4% | ***39.0%*** | ***38.5%*** | Income Tax Rate | ***38.0%*** |
| | | | | | | -- | -- | -- | -- | -- | -- | -- | -- | 12.5% | 10.0% | ***10.0%*** | ***10.0%*** | AFUDC % to Net Profit | ***15.0%*** |
| | | | | | | -- | -- | -- | -- | -- | 56.1% | 50.9% | 53.1% | 56.9% | 56.8% | ***56.5%*** | ***56.5%*** | Long-Term Debt Ratio | ***56.5%*** |
| | | | | | | -- | -- | -- | -- | -- | 43.9% | 49.1% | 46.9% | 43.1% | 43.2% | ***43.5%*** | ***43.5%*** | Common Equity Ratio | ***43.5%*** |
| | | | | | | -- | -- | -- | -- | -- | 8692.8 | 9245.7 | 8750.2 | 9289.0 | 9561.3 | ***9800*** | ***10000*** | Total Capital ($mill) | ***10500*** |
| | | | | | | -- | -- | -- | -- | -- | 8720.6 | 9318.0 | 9991.8 | 10524 | 11059 | ***11450*** | ***11900*** | Net Plant ($mill) | ***13150*** |
| | | | | | | -- | -- | -- | -- | -- | NMF | NMF | 3.7% | 3.8% | 4.4% | ***4.5%*** | ***5.0%*** | Return on Total Cap'l | ***5.5%*** |
| | | | | | | -- | -- | -- | -- | -- | NMF | NMF | 4.6% | 5.2% | 6.5% | ***7.5%*** | ***8.0%*** | Return on Shr. Equity | ***9.0%*** |
| | | | | | | -- | -- | -- | -- | -- | NMF | NMF | 4.6% | 5.2% | 6.5% | ***7.5%*** | ***8.0%*** | Return on Com Equity | ***9.0%*** |
| | | | | | | -- | -- | -- | -- | -- | NMF | NMF | 3.0% | 1.8% | 2.8% | ***3.5%*** | ***4.0%*** | Retained to Com Eq | ***4.5%*** |
| | | | | | | -- | -- | -- | -- | -- | -- | -- | 34% | 65% | 56% | ***52%*** | ***51%*** | All Div'ds to Net Prof | ***51%*** |

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $5821.0 mill. **Due in 5 Yrs** $325.9 mill.
**LT Debt** $5362.6 mill. **LT Interest** $315.0 mill.
(Total interest coverage: 2.6x) (56% of Cap'l)

**Leases, Uncapitalized:** Annual rentals $25.7 mill.
**Pension Assets-12/10** $861.0 mill
**Oblig.** $1285.5 mill.
**Pfd Stock** $27.8 mill. **Pfd Div'd** NMF

**Common Stock** 175,445,661 shs.
**as of 7/28/11**

**MARKET CAP: $5.3 billion (Large Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 22.3 | 13.1 | 13.5 |
| Other | 476.8 | 521.2 | 1479.7 |
| Current Assets | 499.1 | 534.3 | 1493.2 |
| Accts Payable | 138.6 | 199.2 | 159.0 |
| Debt Due | 173.6 | 44.8 | 458.4 |
| Other | 295.2 | 530.5 | 710.2 |
| Current Liab. | 607.4 | 774.5 | 1327.6 |
| Fix. Chg. Cov. | 210% | 237% | *250%* |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | -- | -- | *3.5%* |
| "Cash Flow" | -- | -- | *5.0%* |
| Earnings | -- | -- | *9.5%* |
| Dividends | -- | -- | *8.0%* |
| Book Value | -- | -- | *Nil* |

| Calendar | QUARTERLY REVENUES ($ mill.) Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 506.8 | 589.4 | 672.2 | 568.5 | 2336.9 |
| 2009 | 550.2 | 612.7 | 680.0 | 597.8 | 2440.7 |
| 2010 | 588.1 | 671.2 | 786.9 | 664.5 | 2710.7 |
| 2011 | 610.9 | 674.2 | ***810*** | ***724.9*** | ***2820*** |
| 2012 | ***645*** | ***730*** | ***865*** | ***760*** | ***3000*** |

| Calendar | EARNINGS PER SHARE [A] Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .04 | .28 | .55 | .23 | 1.10 |
| 2009 | .19 | .32 | .52 | .21 | 1.25 |
| 2010 | .18 | .42 | .71 | .23 | 1.53 |
| 2011 | .24 | .46 | ***.78*** | ***.27*** | ***1.75*** |
| 2012 | ***.27*** | ***.50*** | ***.84*** | ***.29*** | ***1.90*** |

| Calendar | QUARTERLY DIVIDENDS PAID [B■] Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | -- | -- | -- | -- | -- |
| 2008 | -- | -- | .20 | .20 | .40 |
| 2009 | .20 | .20 | .21 | .21 | .82 |
| 2010 | .21 | .21 | .22 | .22 | .86 |
| 2011 | .22 | .23 | .23 | | |

**BUSINESS:** American Water Works Company, Inc. is the largest investor-owned water and wastewater utility in the U.S., providing services to over 15 million people in over 30 states and Canada. Its nonregulated business assists municipalities and military bases with the maintenance and upkeep as well. Regulated operations made up over 89% of 2010 revenues. New Jersey is its biggest market accounting for over 19% of revenues. Has roughly 7,000 employees. Depreciation rate, 2.5% in '10. BlackRock, Inc., owns 6.9% of the common stock outstanding. Off. & dir. own less than 1%. President & CEO; Jeffry Sterba. Chairman; George Mackenzie. Address: 1025 Laurel Oak Road, Voorhees, NJ 08043. Telephone: 856-346-8200. Internet: www.amwater.com.

**American Water Works looks a little different these days.** In line with its aggressive M&A strategy, it recently increased its presence in Missouri and Ohio, while selling operations in Texas, Arizona, and New Mexico. Meanwhile, it has also announced that it will purchase seven water systems in New York.

**But it's been business as usual for the water utility.** The company posted 10% share-net growth in the second quarter, on a 6% top-line advance. (It should be noted that the latest batch of results accounts for the aforementioned alterations to the business model, but the prior year's figures do not because we do not restate past results.) An improved regulatory environment was largely responsible, as AWR received a rate case ruling generating another $10.7 million in annual revenues.

**We have raised our earnings estimate for this year and next to account for ongoing momentum on the regulatory front.** The company has since received another $4.8 million ruling, and has an additional $315 million or so in cases under review. Although we do not expect all of the money being sought to make its way to Americans' pockets, the recent success has us optimistic that more favorable rulings are in the works. As a result, we now look for 18% earnings growth in 2011.

**The stock has held firm since our last report despite the broader marker selloff.** AWK is benefiting not only from its strong recent showing, but also the perception that it is a safe haven during times of economic instability. The market has been extremely volatile, with wide swings from day to day, and fears of another recession have many on Wall Street looking to park their money until there are signs of stability. Given the murky economic outlook, we award this issue with our Highest (1) ranking for the coming six to 12 months.

**The allure fades a bit looking further out, however.** The costs of fixing and maintain aging water systems will remain on the rise, and will likely eat away at a healthy portion of the profits enjoyed from any regulatory benefits. Although the dividend is healthy, income-minded investors have better alternatives to choose from in the electric utility industry.

*Andre J. Costanza* *October 21, 2011*

**(A)** Diluted earnings. Excludes nonrecurring gains (losses): '08, ($4.62); '09, ($2.63). Discontinued operations: '06, (4¢); '11, 9¢.
Next earnings report due early Nov. Quarterly earnings may not sum due to rounding.
**(B)** Dividends to be paid in February, May, August, and November. ■ Div. reinvestment available.
**(C)** In millions.
**(D)** Includes intangibles. In 2010: $1.251 billion, $7.15/share.

| | |
|---|---|
| **Company's Financial Strength** | B |
| **Stock's Price Stability** | 90 |
| **Price Growth Persistence** | NMF |
| **Earnings Predictability** | 15 |

# AQUA AMERICA NYSE-WTR

RECENT PRICE **21.30** | P/E RATIO **20.1** (Trailing: 22.2 Median: 25.0) | RELATIVE P/E RATIO **1.47** | DIV'D YLD **3.1%** | **VALUE LINE**

TIMELINESS **3** Lowered 1/21/11
SAFETY **3** Lowered 8/1/03
TECHNICAL **3** Raised 6/10/11
BETA .65 (1.00 = Market)

**2014-16 PROJECTIONS**

| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 35 | (+65%) | *16%* |
| Low | 25 | (+15%) | *8%* |

**Insider Decisions**

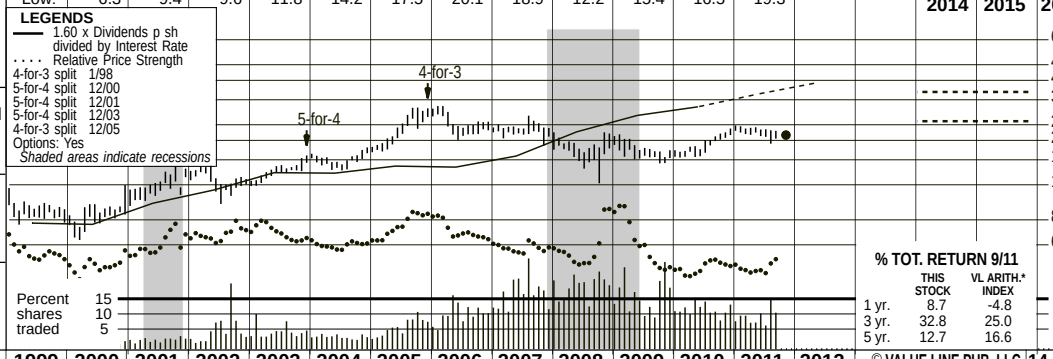
| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| to Buy | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Options | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| to Sell | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 101 | 81 | 106 |
| to Sell | 94 | 112 | 104 |
| Hld's(000) | 55463 | 55308 | 55457 |

| | High: | 12.0 | 14.8 | 15.0 | 16.8 | 18.5 | 29.2 | 29.8 | 26.6 | 22.0 | 21.5 | 23.0 | 23.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low: | 6.3 | 9.4 | 9.6 | 11.8 | 14.2 | 17.5 | 20.1 | 18.9 | 12.2 | 15.4 | 16.5 | 19.3 |

LEGENDS
1.60 x Dividends p sh divided by Interest Rate
Relative Price Strength
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 areas indicate recessions*




Target Price Range 2014 | 2015 | 2016
64 48 40 32 24 20 16 12 8 6

**% TOT. RETURN 9/11**

| | THIS STOCK | VL ARITH.* INDEX |
|---|---|---|
| 1 yr. | 8.7 | -4.8 |
| 3 yr. | 32.8 | 25.0 |
| 5 yr. | 12.7 | 16.6 |

| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | © VALUE LINE PUB. LLC | 14-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.84 | 1.86 | 2.02 | 2.09 | 2.41 | 2.46 | 2.70 | 2.85 | 2.97 | 3.48 | 3.85 | 4.03 | 4.52 | 4.63 | 4.91 | 5.26 | ***5.55*** | ***5.85*** | Revenues per sh | ***6.80*** |
| .47 | .50 | .56 | .61 | .72 | .76 | .86 | .94 | .96 | 1.09 | 1.21 | 1.26 | 1.37 | 1.42 | 1.61 | 1.78 | ***1.95*** | ***2.05*** | "Cash Flow" per sh | ***2.40*** |
| .29 | .30 | .34 | .40 | .42 | .47 | .51 | .54 | .57 | .64 | .71 | .70 | .71 | .73 | .77 | .90 | ***1.05*** | ***1.10*** | Earnings per sh [A] | ***1.40*** |
| .22 | .23 | .24 | .26 | .27 | .28 | .30 | .32 | .35 | .37 | .40 | .44 | .48 | .51 | .55 | .59 | ***.62*** | ***.66*** | Div'd Decl'd per sh [B]■ | ***.78*** |
| .52 | .48 | .58 | .82 | .90 | 1.16 | 1.09 | 1.20 | 1.32 | 1.54 | 1.84 | 2.05 | 1.79 | 1.98 | 2.08 | 2.37 | ***2.30*** | ***2.35*** | Cap'l Spending per sh | ***2.50*** |
| 2.46 | 2.69 | 2.84 | 3.21 | 3.42 | 3.85 | 4.15 | 4.36 | 5.34 | 5.89 | 6.30 | 6.96 | 7.32 | 7.82 | 8.12 | 8.51 | ***8.95*** | ***9.40*** | Book Value per sh | ***11.05*** |
| 63.74 | 65.75 | 67.47 | 72.20 | 106.80 | 111.82 | 113.97 | 113.19 | 123.45 | 127.18 | 128.97 | 132.33 | 133.40 | 135.37 | 136.49 | 137.97 | ***138.90*** | ***139.90*** | Common Shs Outst'g [C] | ***142.90*** |
| 12.0 | 15.6 | 17.8 | 22.5 | 21.2 | 18.2 | 23.6 | 23.6 | 24.5 | 25.1 | 31.8 | 34.7 | 32.0 | 24.9 | 23.1 | 21.1 | ***Bold figures are Value Line estimates*** | | Avg Ann'l P/E Ratio | ***21.0*** |
| .80 | .98 | 1.03 | 1.17 | 1.21 | 1.18 | 1.21 | 1.29 | 1.40 | 1.33 | 1.69 | 1.87 | 1.70 | 1.50 | 1.54 | 1.36 | | | Relative P/E Ratio | ***1.40*** |
| 6.2% | 4.9% | 3.9% | 2.9% | 3.0% | 3.3% | 2.5% | 2.5% | 2.5% | 2.3% | 1.8% | 1.8% | 2.1% | 2.8% | 3.1% | 3.1% | | | Avg Ann'l Div'd Yield | ***2.7%*** |
| 307.3 | 322.0 | 367.2 | 442.0 | 496.8 | 533.5 | 602.5 | 627.0 | 670.5 | 726.1 | ***765*** | ***810*** | Revenues ($mill) | ***960*** |
| 58.5 | 62.7 | 67.3 | 80.0 | 91.2 | 92.0 | 95.0 | 97.9 | 104.4 | 124.0 | ***145*** | ***155*** | Net Profit ($mill) | ***200*** |
| 39.3% | 38.5% | 39.3% | 39.4% | 38.4% | 39.6% | 38.9% | 39.7% | 39.4% | 39.2% | ***40.0%*** | ***40.0%*** | Income Tax Rate | ***40.0%*** |
| -- | -- | -- | -- | -- | -- | -- | -- | 2.9% | 3.1% | ***3.0%*** | ***3.0%*** | AFUDC % to Net Profit | ***2.0%*** |
| 52.2% | 54.2% | 51.4% | 50.0% | 52.0% | 51.6% | 55.4% | 54.1% | 55.6% | 56.6% | ***54.0%*** | ***52.0%*** | Long-Term Debt Ratio | ***47.0%*** |
| 47.7% | 45.8% | 48.6% | 50.0% | 48.0% | 48.4% | 44.6% | 45.9% | 44.4% | 43.4% | ***46.0%*** | ***48.0%*** | Common Equity Ratio | ***53.0%*** |
| 990.4 | 1076.2 | 1355.7 | 1497.3 | 1690.4 | 1904.4 | 2191.4 | 2306.6 | 2495.2 | 2706.2 | ***2715*** | ***2760*** | Total Capital ($mill) | ***2950*** |
| 1368.1 | 1490.8 | 1824.3 | 2069.8 | 2280.0 | 2506.0 | 2792.8 | 2997.4 | 3227.3 | 3469.3 | ***3630*** | ***3795*** | Net Plant ($mill) | ***4320*** |
| 7.8% | 7.6% | 6.4% | 6.7% | 6.9% | 6.4% | 5.9% | 5.7% | 5.6% | 5.9% | ***6.5%*** | ***7.0%*** | Return on Total Cap'l | ***8.0%*** |
| 12.3% | 12.7% | 10.2% | 10.7% | 11.2% | 10.0% | 9.7% | 9.3% | 9.4% | 10.6% | ***11.5%*** | ***11.5%*** | Return on Shr. Equity | ***12.5%*** |
| 12.4% | 12.7% | 10.2% | 10.7% | 11.2% | 10.0% | 9.7% | 9.3% | 9.4% | 10.6% | ***11.5%*** | ***11.5%*** | Return on Com Equity | ***12.5%*** |
| 5.1% | 5.2% | 4.2% | 4.6% | 4.9% | 3.7% | 3.2% | 2.8% | 2.7% | 3.7% | ***5.0%*** | ***4.5%*** | Retained to Com Eq | ***5.5%*** |
| 59% | 59% | 59% | 57% | 56% | 63% | 67% | 70% | 72% | 65% | ***59%*** | ***60%*** | All Div'ds to Net Prof | ***56%*** |

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $1559.0 mill. **Due in 5 Yrs** $310 mill.
**LT Debt** $1468.5 mill. **LT Interest** $66.1 mill.
(LT interest earned: 4.5x; total interest coverage: 4.5x) (55% of Cap'l)

**Pension Assets-12/10** $159.2 mill.
**Oblig.** $234.9 mill.

**Pfd Stock** None
**Common Stock** 138,405,123 shares
**as of 7/22/11**
**MARKET CAP: $3.0 billion (Mid Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 21.9 | 5.9 | 6.9 |
| Receivables | 78.7 | 85.9 | 93.6 |
| Inventory (AvgCst) | 9.5 | 9.2 | 12.0 |
| Other | 11.5 | 44.4 | 65.5 |
| Current Assets | 121.6 | 145.4 | 178.0 |
| Accts Payable | 57.9 | 45.3 | 42.7 |
| Debt Due | 87.0 | 28.5 | 90.5 |
| Other | 56.1 | 149.9 | 173.7 |
| Current Liab. | 201.0 | 223.7 | 306.9 |
| Fix. Chg. Cov. | 346% | 290% | 340% |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | 8.0% | 7.5% | *6.5%* |
| "Cash Flow" | 8.5% | 8.0% | *8.0%* |
| Earnings | 6.5% | 4.5% | *10.5%* |
| Dividends | 7.5% | 8.0% | *5.5%* |
| Book Value | 9.0% | 7.0% | *6.0%* |

| Calendar | QUARTERLY REVENUES ($ mill.) Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 139.3 | 151.0 | 177.1 | 159.6 | 627.0 |
| 2009 | 154.5 | 167.3 | 180.8 | 167.9 | 670.5 |
| 2010 | 160.5 | 178.5 | 207.8 | 179.3 | 726.1 |
| 2011 | 171.3 | 188.2 | ***220*** | ***185.5*** | ***765*** |
| 2012 | ***180*** | ***200*** | ***230*** | ***200*** | ***810*** |

| Calendar | EARNINGS PER SHARE [A] Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .11 | .17 | .26 | .19 | .73 |
| 2009 | .14 | .19 | .25 | .19 | .77 |
| 2010 | .16 | .22 | .32 | .20 | .90 |
| 2011 | .19 | .25 | ***.32*** | ***.29*** | ***1.05*** |
| 2012 | ***.20*** | ***.25*** | ***.37*** | ***.28*** | ***1.10*** |

| Calendar | QUARTERLY DIVIDENDS PAID [B]■ Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | .115 | .115 | .125 | .125 | .48 |
| 2008 | .125 | .125 | .125 | .135 | .51 |
| 2009 | .135 | .135 | .135 | .145 | .55 |
| 2010 | .145 | .145 | .145 | .155 | .59 |
| 2011 | .155 | .155 | .155 | | |

**BUSINESS:** Aqua America, Inc. is the holding company for water and wastewater utilities that serve approximately three 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 '10: residential, 59.5%; commercial, 14.5%; industrial & other, 26.0%. Officers and directors own 2.0% of the common stock (4/11 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 should end 2011 on a strong note.** Favorable rate rulings, along with stronger-than-expected consumer demand, are slated to be the key drivers of top- and bottom-line growth.

**The company entered into a joint venture with MLP Penn Virginia Resource Partners,** to construct and operate a fresh water pipeline. The project will be supplying water to natural gas producers in the Lycoming County, PA, area of the Marcellus Shale. The joint venture has been named PVR Water Services, with a $12 million initial stake from each partner. Range Resources has been contracted as the first customer. The pipeline is anticipated to be operational by the beginning of 2012, though no solid end date has been given. We believe that this project is one of many steps the company is taking to establish itself as a major beneficiary of the Marcellus Shale project. As a result, there should be a significant boost to revenues and earnings as the company's customer base expands.

**Rate rulings are still on the agenda.** The company received several favorable rate rulings last year, and is currently planning on filing cases in seven more jurisdictions by the yearend. Given Aqua America's track record, these rulings will likely contribute to revenue and earnings from 2012 onward.

**Aqua America is getting out of some markets.** Management's plan to exit several difficult operating environments is progressing smoothly. To this end, it sold its Maine operations (consisting of 11 water systems) to Connecticut Water, for $53.5 million, in the second quarter. The company also announced another deal with American Water Works (it swapped its Missouri properties in the first quarter for American Water's Texas operations.) Also, Aqua America will be swapping its New York properties to American Water in exchange for the latter's Ohio facilities. Both deals are slated to expand its customer base in fast-growing sectors, while getting Aqua America out from its underperforming areas. The deals should be done by the end of this year or 2012's first quarter.

**This equity has an above industry average yield,** for income investors.

*Sahana Zutshi* *October 21, 2011*

**(A)** Diluted egs. Excl. nonrec. gains (losses): '99, (11¢); '00, 2¢; '01, 2¢; '02, 5¢; '03, 4¢. Excl. gain from disc. operations: '96, 2¢. Next earnings report due late October.

**(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** | 100 |
| **Price Growth Persistence** | 70 |
| **Earnings Predictability** | 100 |

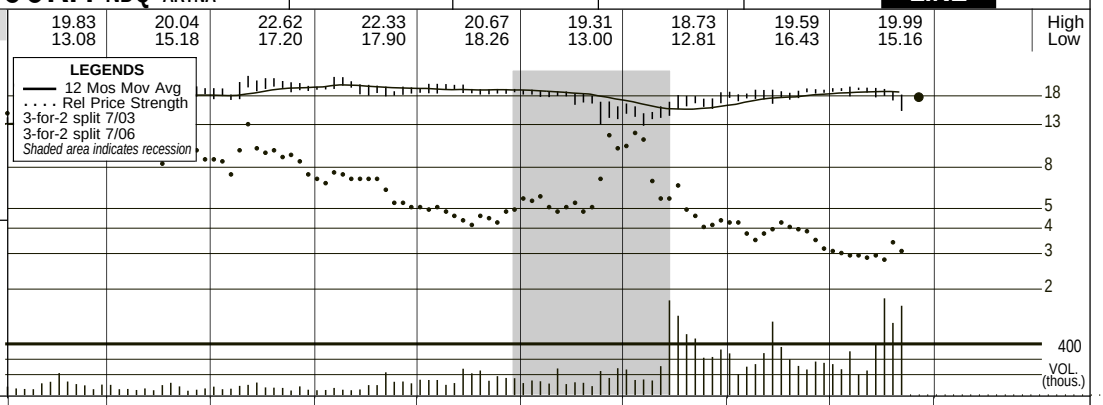
# ARTESIAN RES. CORP. NDQ--ARTNA

RECENT PRICE 17.72 | TRAILING P/E RATIO 19.7 | RELATIVE P/E RATIO 1.30 | DIV'D YLD 4.3% | VALUE LINE

## RANKS

| | | |
|---|---|---|
| PERFORMANCE | 2 | Above Average |
| Technical | 3 | Average |
| SAFETY | 2 | Above Average |
| BETA .60 | (1.00 = Market) | |

| | |
|---|---|
| Financial Strength | B+ |
| Price Stability | 100 |
| Price Growth Persistence | 60 |
| Earnings Predictability | 90 |




| © VALUE LINE PUBLISHING LLC | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012/2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| SALES PER SH | 6.20 | 6.67 | 7.52 | 7.77 | 7.20 | 7.59 | 8.11 | 8.48 | -- | |
| "CASH FLOW" PER SH | 1.28 | 1.42 | 1.56 | 1.75 | 1.57 | 1.65 | 1.84 | 1.92 | -- | |
| EARNINGS PER SH | .64 | .72 | .81 | .97 | .90 | .86 | .97 | 1.00 | ***.92*** [A,B] | ***1.10*** [C]***/NA*** |
| DIV'DS DECL'D PER SH | .53 | .55 | .58 | .61 | .66 | .71 | .72 | .75 | -- | |
| CAP'L SPENDING PER SH | 4.20 | 4.82 | 3.35 | 5.08 | 3.66 | 6.09 | 2.32 | 2.57 | -- | |
| BOOK VALUE PER SH | 9.01 | 9.26 | 9.60 | 10.15 | 11.66 | 11.86 | 12.15 | 12.44 | -- | |
| COMMON SHS OUTST'G (MILL) | 5.85 | 5.93 | 6.02 | 6.09 | 7.30 | 7.40 | 7.51 | 7.65 | -- | |
| AVG ANN'L P/E RATIO | 24.7 | 25.4 | 24.2 | 20.3 | 21.5 | 20.1 | 16.4 | 18.2 | ***19.3*** | ***16.1/NA*** |
| RELATIVE P/E RATIO | 1.41 | 1.34 | 1.28 | 1.10 | 1.14 | 1.21 | 1.09 | 1.16 | -- | |
| AVG ANN'L DIV'D YIELD | 3.4% | 3.0% | 2.9% | 3.1% | 3.4% | 4.1% | 4.5% | 4.1% | -- | |
| SALES ($MILL) | 36.3 | 39.6 | 45.3 | 47.3 | 52.5 | 56.2 | 60.9 | 64.9 | -- | ***Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.*** |
| OPERATING MARGIN | -- | -- | 100.0% | 45.6% | 45.6% | 45.1% | 46.9% | 46.5% | -- | |
| DEPRECIATION ($MILL) | 3.6 | 4.0 | 4.4 | 4.6 | 5.2 | 5.8 | 6.6 | 7.0 | -- | |
| NET PROFIT ($MILL) | 3.9 | 4.4 | 5.0 | 6.1 | 6.3 | 6.4 | 7.3 | 7.6 | -- | |
| INCOME TAX RATE | 37.9% | 39.6% | 39.9% | 39.0% | 39.8% | 40.8% | 40.1% | 40.0% | -- | |
| NET PROFIT MARGIN | 10.8% | 11.1% | 11.1% | 12.8% | 11.9% | 11.4% | 11.9% | 11.7% | -- | |
| WORKING CAP'L ($MILL) | d10.5 | d8.7 | d1.8 | d8.8 | 2.5 | d20.9 | d23.3 | d27.9 | -- | |
| LONG-TERM DEBT ($MILL) | 80.6 | 82.4 | 92.4 | 92.1 | 91.8 | 107.6 | 106.0 | 105.1 | -- | |
| SHR. EQUITY ($MILL) | 52.7 | 54.9 | 57.8 | 61.8 | 85.1 | 87.8 | 91.2 | 95.1 | -- | |
| RETURN ON TOTAL CAP'L | 4.5% | 5.1% | 5.3% | 5.8% | 5.3% | 4.7% | 5.2% | 5.6% | -- | |
| RETURN ON SHR. EQUITY | 7.4% | 8.0% | 8.7% | 9.8% | 7.4% | 7.3% | 8.0% | 8.0% | -- | |
| RETAINED TO COM EQ | 1.4% | 2.1% | 2.7% | 3.8% | 2.1% | 1.4% | 2.1% | 2.0% | -- | |
| ALL DIV'DS TO NET PROF | 81% | 74% | 69% | 61% | 71% | 81% | 74% | 75% | -- | |

[A]*No. of analysts changing earn. est. in last 8 days: 0 up, 0 down, consensus 5-year earnings growth not available.* [B]*Based upon 4 analysts' estimates.* [C]*Based upon 4 analysts' estimates.*

### ANNUAL RATES

| *of change (per share)* | 5 Yrs. | 1 Yr. |
|---|---|---|
| Sales | 3.5% | 4.5% |
| "Cash Flow" | 5.0% | 4.0% |
| Earnings | 5.5% | 3.0% |
| Dividends | 5.5% | 4.5% |
| Book Value | 5.5% | 2.5% |

### QUARTERLY SALES ($mill.)

| Fiscal Year | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/09 | 13.9 | 15.4 | 16.1 | 15.5 | 60.9 |
| 12/31/10 | 15.0 | 16.0 | 18.0 | 15.9 | 64.9 |
| 12/31/11 | 14.8 | 16.5 | | | |
| 12/31/12 | | | | | |

### EARNINGS PER SHARE

| Fiscal Year | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/08 | .13 | .21 | .35 | .17 | .86 |
| 12/31/09 | .22 | .27 | .28 | .20 | .97 |
| 12/31/10 | .22 | .24 | .38 | .16 | 1.00 |
| 12/31/11 | .13 | .23 | ***.34*** | ***.22*** | |
| 12/31/12 | | | | | |

### QUARTERLY DIVIDENDS PAID

| Cal-endar | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 2008 | .172 | .178 | .178 | .178 | .71 |
| 2009 | .178 | .178 | .178 | .187 | .72 |
| 2010 | .187 | .188 | .188 | .189 | .75 |
| 2011 | .189 | .19 | .19 | | |

### INSTITUTIONAL DECISIONS

| | 4Q'10 | 1Q'11 | 2Q'11 |
|---|---|---|---|
| to Buy | 23 | 24 | 25 |
| to Sell | 21 | 19 | 15 |
| Hld's(000) | 2190 | 2308 | 2347 |

| ASSETS ($mill.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | .5 | .2 | .2 |
| Receivables | 9.0 | 5.1 | 8.8 |
| Inventory | 1.2 | 1.2 | 1.4 |
| Other | 2.5 | 7.5 | .9 |
| Current Assets | 13.2 | 14.0 | 11.3 |
| Property, Plant & Equip, at cost | 403.0 | 414.6 | - - |
| Accum Depreciation | 64.9 | 69.2 | - - |
| Net Property | 338.1 | 345.4 | 352.5 |
| Other | 7.6 | 12.1 | 8.0 |
| Total Assets | 358.9 | 371.5 | 371.8 |
| **LIABILITIES ($mill.)** | | | |
| Accts Payable | 3.7 | 3.4 | 2.6 |
| Debt Due | 27.7 | 30.6 | 27.7 |
| Other | 5.1 | 7.9 | 8.0 |
| Current Liab | 36.5 | 41.9 | 38.3 |

**LONG-TERM DEBT AND EQUITY as of 6/30/11**

**Total Debt** $134.4 mill. **Due in 5 Yrs.** NA
**LT Debt** $106.7 mill.
**Including Cap. Leases** NA (53% of Cap'l)

**Leases, Uncapitalized** Annual rentals NA

**Pension Liability** $.5 mill. in '10 vs. $.7 mill. in '09

**Pfd Stock** None **Pfd Div'd Paid** None

**Common Stock** 7,675,000 shares (47% of Cap'l)

## INDUSTRY: Water Utility

**BUSINESS:** Artesian Resources Corporation, through its subsidiaries, provides water, wastewater, and other services on the Delmarva Peninsula. The company distributes and sells water, including water for public and private fire protection, to residential, commercial, industrial, municipal, and utility customers throughout Delaware, Maryland, and Pennsylvania. It also provides wastewater services to customers in Delaware and has entered into purchase agreements to provide wastewater services in Maryland. In addition, Artesian provides contract water and wastewater operations, water and sewer service line protection plans, wastewater management services, and design, construction, and engineering services. Artesian Resources is the parent holding company of Artesian Water Company, Inc., Artesian Water Pennsylvania, Inc., Artesian Water Maryland, Inc., Artesian Wastewater Management, Inc., Artesian Wastewater Maryland, Inc. and three other entities. Has 426 employees. Chairman, C.E.O. & President: Dian C. Taylor. Address: 664 Churchmans Rd., Newark, DE 19702. Tel.: 302 453-6900. Internet: http://www.artesianwater.com.

*J.V.*

*October 21, 2011*

### TOTAL SHAREHOLDER RETURN

*Dividends plus appreciation as of 9/30/2011*

| 3 Mos. | 6 Mos. | 1 Yr. | 3 Yrs. | 5 Yrs. |
|---|---|---|---|---|
| -1.80% | -8.30% | -4.43% | 18.87% | 13.80% |

# CALIFORNIA WATER NYSE-CWT

RECENT PRICE 17.84 | P/E RATIO 15.9 (Trailing: 19.4 Median: 22.0) | RELATIVE P/E RATIO 1.16 | DIV'D YLD 3.5% | VALUE LINE

TIMELINESS 3 Raised 7/22/11
SAFETY 3 Lowered 7/27/07
TECHNICAL 3 Lowered 10/7/11
BETA .70 (1.00 = Market)

**2014-16 PROJECTIONS**

| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 35 | (+95%) | *20%* |
| Low | 20 | (+10%) | *6%* |

**Insider Decisions**

| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| to Buy | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 0 | 0 |
| Options | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| to Sell | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 62 | 56 | 60 |
| to Sell | 48 | 49 | 48 |
| Hld's(000) | 20250 | 21158 | 21479 |

| | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| High: | 15.7 | 14.3 | 13.4 | 15.7 | 19.0 | 21.1 | 22.9 | 22.7 | 23.3 | 24.1 | 19.8 | 19.4 | | | | | | |
| Low: | 10.8 | 11.4 | 10.2 | 11.8 | 13.0 | 15.6 | 16.4 | 17.1 | 13.8 | 16.7 | 16.9 | 16.7 | | | | | | |
| Revenues per sh | 6.58 | 7.24 | 7.74 | 7.38 | 7.98 | 8.08 | 8.13 | 8.67 | 8.18 | 8.59 | 8.72 | 8.10 | 8.88 | 9.90 | 10.82 | 11.05 | *11.80* | *12.05* |
| "Cash Flow" per sh | 1.04 | 1.25 | 1.46 | 1.30 | 1.37 | 1.26 | 1.10 | 1.32 | 1.26 | 1.42 | 1.52 | 1.36 | 1.56 | 1.86 | 1.93 | 1.93 | *2.25* | *2.45* |
| Earnings per sh A | .58 | .75 | .92 | .73 | .77 | .66 | .47 | .63 | .61 | .73 | .74 | .67 | .75 | .95 | .98 | .91 | *1.10* | *1.20* |
| Div'd Decl'd per sh B ■ | .51 | .52 | .53 | .54 | .54 | .55 | .56 | .56 | .56 | .57 | .57 | .58 | .58 | .59 | .59 | .60 | *.62* | *.64* |
| Cap'l Spending per sh | 1.09 | 1.41 | 1.30 | 1.37 | 1.72 | 1.23 | 2.04 | 2.91 | 2.19 | 1.87 | 2.01 | 2.14 | 1.84 | 2.41 | 2.66 | 2.97 | *2.50* | *2.75* |
| Book Value per sh C | 5.86 | 6.11 | 6.50 | 6.69 | 6.71 | 6.45 | 6.48 | 6.56 | 7.22 | 7.83 | 7.90 | 9.07 | 9.25 | 9.72 | 10.13 | 10.45 | *10.75* | *10.90* |
| Common Shs Outst'g D | 25.08 | 25.24 | 25.24 | 25.24 | 25.87 | 30.29 | 30.36 | 30.36 | 33.86 | 36.73 | 36.78 | 41.31 | 41.33 | 41.45 | 41.53 | 41.67 | *42.75* | *44.00* |
| Avg Ann'l P/E Ratio | 13.7 | 11.9 | 12.6 | 17.8 | 17.8 | 19.6 | 27.1 | 19.8 | 22.1 | 20.1 | 24.9 | 29.2 | 26.1 | 19.8 | 19.7 | 20.3 | | |
| Relative P/E Ratio | .92 | .75 | .73 | .93 | 1.01 | 1.27 | 1.39 | 1.08 | 1.26 | 1.06 | 1.33 | 1.58 | 1.39 | 1.19 | 1.31 | 1.30 | | |
| Avg Ann'l Div'd Yield | 6.4% | 5.8% | 4.6% | 4.2% | 4.0% | 4.3% | 4.4% | 4.5% | 4.2% | 3.9% | 3.1% | 2.9% | 3.0% | 3.1% | 3.1% | 3.2% | | |
| Revenues ($mill) E | 246.8 | 263.2 | 277.1 | 315.6 | 320.7 | 334.7 | 367.1 | 410.3 | 449.4 | 460.4 | *505* | *530* | | | | | | |
| Net Profit ($mill) | 14.4 | 19.1 | 19.4 | 26.0 | 27.2 | 25.6 | 31.2 | 39.8 | 40.6 | 37.7 | *47.0* | *52.0* | | | | | | |
| Income Tax Rate | 39.4% | 39.7% | 39.9% | 39.6% | 42.4% | 37.4% | 39.9% | 37.7% | 40.3% | 39.5% | *35.0%* | *36.5%* | | | | | | |
| AFUDC % to Net Profit | - - | - - | 10.3% | 3.2% | 3.3% | 10.6% | 8.3% | 8.6% | 7.6% | 4.2% | *10.0%* | *10.0%* | | | | | | |
| Long-Term Debt Ratio | 50.3% | 55.3% | 50.2% | 48.6% | 48.3% | 43.5% | 42.9% | 41.6% | 47.1% | 52.4% | *51.5%* | *51.0%* | | | | | | |
| Common Equity Ratio | 48.8% | 44.0% | 49.1% | 50.8% | 51.1% | 55.9% | 56.6% | 58.4% | 52.9% | 47.6% | *48.5%* | *49.0%* | | | | | | |
| Total Capital ($mill) | 402.7 | 453.1 | 498.4 | 565.9 | 568.1 | 670.1 | 674.9 | 690.4 | 794.9 | 914.7 | *945* | *980* | | | | | | |
| Net Plant ($mill) | 624.3 | 697.0 | 759.5 | 800.3 | 862.7 | 941.5 | 1010.2 | 1112.4 | 1198.1 | 1294.3 | *1350* | *1410* | | | | | | |
| Return on Total Cap'l | 5.3% | 5.9% | 5.6% | 6.1% | 6.3% | 5.2% | 5.9% | 7.1% | 6.5% | 5.5% | *6.5%* | *7.0%* | | | | | | |
| Return on Shr. Equity | 7.2% | 9.4% | 7.8% | 8.9% | 9.3% | 6.8% | 8.1% | 9.9% | 9.6% | 8.6% | *10.0%* | *10.5%* | | | | | | |
| Return on Com Equity | 7.2% | 9.5% | 7.9% | 9.0% | 9.3% | 6.8% | 8.1% | 9.9% | 9.6% | 8.6% | *10.0%* | *10.5%* | | | | | | |
| Retained to Com Eq | NMF | 1.0% | .7% | 2.1% | 2.1% | 1.0% | 1.8% | 3.8% | 3.8% | 3.0% | *4.5%* | *5.0%* | | | | | | |
| All Div'ds to Net Prof | 119% | 90% | 91% | 77% | 78% | 86% | 77% | 61% | 60% | 66% | *55%* | *54%* | | | | | | |

*Bold figures are Value Line estimates*

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| | 14-16 |
|---|---|
| Revenues per sh | *14.00* |
| "Cash Flow" per sh | *2.60* |
| Earnings per sh A | *1.35* |
| Div'd Decl'd per sh B ■ | *.70* |
| Cap'l Spending per sh | *3.15* |
| Book Value per sh C | *11.95* |
| Common Shs Outst'g D | *46.50* |
| Avg Ann'l P/E Ratio | *20.5* |
| Relative P/E Ratio | *1.35* |
| Avg Ann'l Div'd Yield | *2.8%* |
| Revenues ($mill) E | *650* |
| Net Profit ($mill) | *63.0* |
| Income Tax Rate | *39.0%* |
| AFUDC % to Net Profit | *10.0%* |
| Long-Term Debt Ratio | *51.0%* |
| Common Equity Ratio | *49.0%* |
| Total Capital ($mill) | *1125* |
| Net Plant ($mill) | *1625* |
| Return on Total Cap'l | *7.5%* |
| Return on Shr. Equity | *11.0%* |
| Return on Com Equity | *11.0%* |
| Retained to Com Eq | *5.5%* |
| All Div'ds to Net Prof | *52%* |

**% TOT. RETURN 9/11**

| | THIS STOCK | VL ARITH.* INDEX |
|---|---|---|
| 1 yr. | -0.9 | -4.8 |
| 3 yr. | 1.3 | 25.0 |
| 5 yr. | 12.4 | 16.6 |

**Target Price Range** 2014 | 2015 | 2016

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $513.1 mill. **Due in 5 Yrs** $51.7 mill.
**LT Debt** $478.0 mill. **LT Interest** $32.0 mill.
(LT interest earned: 3.6x; total int. cov.: 3.3x)
(52% of Cap'l)
**Pension Assets-12/10** $139.0 mill.
**Oblig.** $269.9 mill.
**Pfd Stock** None
**Common Stock** 41,752,032 shs.

**MARKET CAP: $750 million (Small Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 9.9 | 42.3 | 32.9 |
| Other | 82.3 | 83.9 | 98.7 |
| Current Assets | 92.2 | 126.2 | 131.6 |
| Accts Payable | 43.7 | 39.5 | 51.6 |
| Debt Due | 25.0 | 26.1 | 35.1 |
| Other | 41.7 | 41.7 | 44.9 |
| Current Liab. | 110.4 | 107.3 | 131.6 |
| Fix. Chg. Cov. | 430% | 390% | *300%* |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | 3.0% | 4.5% | *5.0%* |
| "Cash Flow" | 4.0% | 6.5% | *5.5%* |
| Earnings | 3.0% | 6.5% | *6.0%* |
| Dividends | 1.0% | 1.0% | *3.0%* |
| Book Value | 4.5% | 5.5% | *3.0%* |

| Calendar | QUARTERLY REVENUES ($ mill.) E Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 72.9 | 105.6 | 131.7 | 100.1 | 410.3 |
| 2009 | 86.6 | 116.7 | 139.2 | 106.9 | 449.4 |
| 2010 | 90.3 | 118.3 | 146.3 | 105.5 | 460.4 |
| 2011 | 98.1 | 131.4 | *160.5* | *115* | *505* |
| 2012 | *103* | *135* | *170* | *122* | *530* |

| Calendar | EARNINGS PER SHARE A Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .01 | .24 | .53 | .17 | .95 |
| 2009 | .06 | .29 | .47 | .16 | .98 |
| 2010 | .05 | .25 | .49 | .12 | .91 |
| 2011 | .05 | .29 | *.59* | *.17* | *1.10* |
| 2012 | *.07* | *.32* | *.62* | *.19* | *1.20* |

| Calendar | QUARTERLY DIVIDENDS PAID B ■ Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | .145 | .145 | .145 | .145 | .58 |
| 2008 | .147 | .147 | .147 | .147 | .59 |
| 2009 | .148 | .148 | .148 | .148 | .59 |
| 2010 | .149 | .149 | .149 | .149 | .60 |
| 2011 | .154 | .154 | .154 | | |

**LEGENDS**
1.33 x Dividends p sh divided by Interest Rate
Relative Price Strength
2-for-1 split 1/98
2-for-1 split 6/11
Options: Yes
*Shaded areas indicate recessions*

Percent shares traded 18 12 6

**BUSINESS:** California Water Service Group provides regulated and nonregulated water service to roughly 470,200 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 Rio Grande Corp; West Hawaii Utilities (9/08). Revenue breakdown, '10: residential, 72%; business, 20%; public authorities, 4%; industrial, 4%. '10 reported depreciation rate: 2.3%. Has roughly 1,127 employees. Chairman: Robert W. Foy. President & CEO: Peter C. Nelson (4/11 Proxy). Inc.: Delaware. Address: 1720 North First Street, San Jose, California 95112-4598. Telephone: 408-367-8200. Internet: www.calwatergroup.com.

**We look for California Water Service Group to gain further momentum in the second half of the year.** Rate increases continued to flow in the second quarter, enabling the water provider to post better-than-expected results in the interim, suggesting that additional increases may be in the pipeline. As a result, we've raised our estimates for the back half of the year, and look for healthy top- and bottom-line growth.

**There could be some more good news on the horizon, too.** CWT recently filed its cost of capital application in an attempt to increase its return on equity a full percentage point, to 11.25%. The regulatory process is unpredictable, but the recent climate appears to have warmed for utilities, particularly in the Golden State. If a favorable decision is handed down by year-end, as expected, this would likely force us to bump up our current 2012 estimates.

**Now may be a good time for many seeking to avoid getting caught up in the recent market volatility to consider initiating a position here.** Water utility stocks are generally less susceptible to wild price swings than the broad market, and CWT is no different as seen by its relative stability since our July review. The current yield is another selling point.

**But the stock loses some appeal, looking further out.** CWT, and most utilities for that matter, typically trail the market averages when times are good, and we do expect the market to recover by 2014-2016. Meanwhile, the cost of running and maintaining a water utility services plant, and all the pipelines and wells that go with it, is a very expensive undertaking. Federal and state requirements are extremely stringent, and systems are growing older by the day. Many require significant upkeep and, in some cases, complete overhauls. These costs are not likely to subside anytime soon, creating some problems for CWT on the cost side of ledger. Indeed, these expenses, along with any necessary capital requirements, will likely temper earnings advances out to mid-decade and thereafter. While the dividend is certainly a plus, CWT still lacks relative total-return potential, and there are better income vehicles on the market, especially in the Electric Utility industry.

*Andre J. Costanza* *October 21, 2011*

| | |
|---|---|
| Company's Financial Strength | B+ |
| Stock's Price Stability | 90 |
| Price Growth Persistence | 60 |
| Earnings Predictability | 85 |

**(A)** Basic EPS. Excl. nonrecurring gain (loss): '00, (4¢); '01, 2¢; '02, 4¢. Next earnings report due late Oct.
**(B)** Dividends historically paid in early Feb., May, Aug., and Nov. ■ Div'd reinvestment plan available.
**(C)** Incl. deferred charges. In '10: $2.2 mill., $0.05/sh.
**(D)** In millions, adjusted for splits.
**(E)** Excludes non-reg. rev.

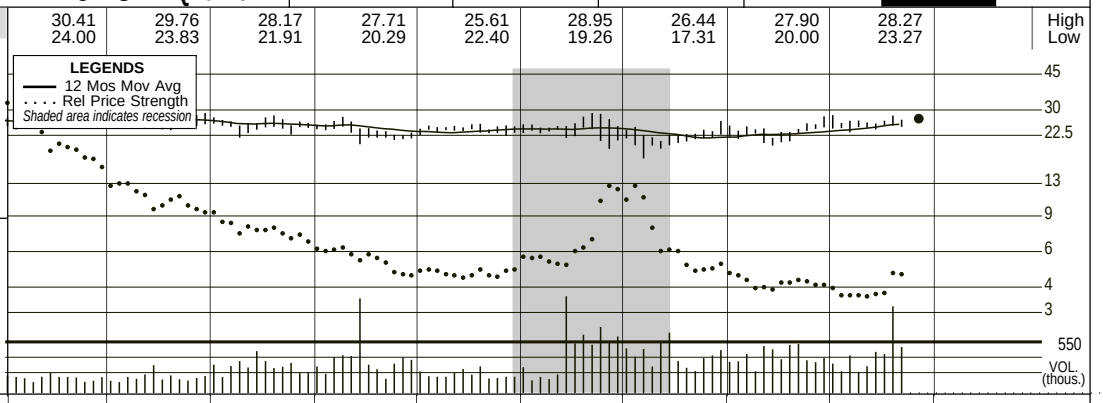
# CONN. WATER SERVICES NDQ--CTWS

RECENT PRICE 27.14 | TRAILING P/E RATIO 19.4 | RELATIVE P/E RATIO 1.28 | DIV'D YLD 3.5% | VALUE LINE

## RANKS

| | | |
|---|---|---|
| PERFORMANCE | 3 | Average |
| Technical | 3 | Average |
| SAFETY | 2 | Above Average |
| BETA .80 | (1.00 = Market) | |

| | |
|---|---|
| Financial Strength | B+ |
| Price Stability | 95 |
| Price Growth Persistence | 25 |
| Earnings Predictability | 80 |




| © VALUE LINE PUBLISHING LLC | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012/2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| SALES PER SH | 5.91 | 6.04 | 5.81 | 5.68 | 7.05 | 7.24 | 6.93 | 7.65 | -- | |
| "CASH FLOW" PER SH | 1.89 | 1.91 | 1.62 | 1.52 | 1.90 | 1.95 | 1.93 | 2.04 | -- | |
| EARNINGS PER SH | 1.15 | 1.16 | .88 | .81 | 1.05 | 1.11 | 1.19 | 1.13 | ***1.28*** [A,B] | ***1.32*** [C]***/NA*** |
| DIV'DS DECL'D PER SH | .83 | .84 | .85 | .86 | .87 | .88 | .90 | .92 | -- | |
| CAP'L SPENDING PER SH | 1.49 | 1.58 | 1.96 | 1.96 | 2.24 | 2.44 | 3.28 | 3.06 | -- | |
| BOOK VALUE PER SH | 10.46 | 10.94 | 11.52 | 11.60 | 11.95 | 12.23 | 12.67 | 13.05 | -- | |
| COMMON SHS OUTST'G (MILL) | 7.97 | 8.04 | 8.17 | 8.27 | 8.38 | 8.46 | 8.57 | 8.68 | -- | |
| AVG ANN'L P/E RATIO | 23.5 | 22.9 | 28.6 | 29.0 | 23.0 | 22.2 | 18.4 | 20.7 | ***21.2*** | ***20.6/NA*** |
| RELATIVE P/E RATIO | 1.34 | 1.21 | 1.51 | 1.57 | 1.22 | 1.34 | 1.22 | 1.32 | -- | |
| AVG ANN'L DIV'D YIELD | 3.0% | 3.1% | 3.4% | 3.6% | 3.6% | 3.6% | 4.1% | 3.9% | -- | |
| SALES ($MILL) | 47.1 | 48.5 | 47.5 | 46.9 | 59.0 | 61.3 | 59.4 | 66.4 | -- | ***Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.*** |
| OPERATING MARGIN | 52.1% | 51.0% | 48.3% | 43.7% | 40.8% | 49.0% | 35.8% | 40.7% | -- | |
| DEPRECIATION ($MILL) | 5.9 | 6.0 | 6.1 | 5.9 | 7.2 | 7.1 | 6.4 | 7.9 | -- | |
| NET PROFIT ($MILL) | 9.2 | 9.4 | 7.2 | 6.7 | 8.8 | 9.4 | 10.2 | 9.8 | -- | |
| INCOME TAX RATE | 17.9% | 22.9% | -- | 23.5% | 32.4% | 27.2% | 19.5% | 35.2% | -- | |
| NET PROFIT MARGIN | 19.5% | 19.4% | 15.1% | 14.3% | 14.9% | 15.4% | 17.2% | 14.8% | -- | |
| WORKING CAP'L ($MILL) | d3.9 | d.7 | 13.0 | 1.2 | 8.1 | d3.3 | d13.1 | d14.7 | -- | |
| LONG-TERM DEBT ($MILL) | 64.8 | 66.4 | 77.4 | 77.3 | 92.3 | 92.2 | 112.0 | 111.7 | -- | |
| SHR. EQUITY ($MILL) | 84.2 | 88.7 | 94.9 | 96.7 | 100.9 | 104.2 | 109.3 | 114.0 | -- | |
| RETURN ON TOTAL CAP'L | 7.5% | 7.0% | 5.0% | 4.9% | 5.5% | 5.9% | 5.5% | 5.4% | -- | |
| RETURN ON SHR. EQUITY | 10.9% | 10.6% | 7.5% | 6.9% | 8.7% | 9.0% | 9.3% | 8.6% | -- | |
| RETAINED TO COM EQ | 3.2% | 3.1% | .3% | NMF | 1.6% | 1.9% | 2.3% | 1.6% | -- | |
| ALL DIV'DS TO NET PROF | 71% | 71% | 95% | 105% | 82% | 79% | 76% | 81% | -- | |

[A]*No. of analysts changing earn. est. in last 8 days: 0 up, 0 down, consensus 5-year earnings growth not available.* [B]*Based upon 6 analysts' estimates.* [C]*Based upon 6 analysts' estimates.*

### ANNUAL RATES

| *of change (per share)* | 5 Yrs. | 1 Yr. |
|---|---|---|
| Sales | 4.0% | 10.5% |
| "Cash Flow" | 2.0% | 5.5% |
| Earnings | 1.5% | -5.0% |
| Dividends | 1.5% | 2.0% |
| Book Value | 3.0% | 3.0% |

| Fiscal Year | QUARTERLY SALES ($mill.) 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/09 | 13.4 | 15.2 | 16.6 | 14.2 | 59.4 |
| 12/31/10 | 13.8 | 15.9 | 21.0 | 15.7 | 66.4 |
| 12/31/11 | 17.5 | 17.4 | | | |
| 12/31/12 | | | | | |

| Fiscal Year | EARNINGS PER SHARE 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/08 | .20 | .35 | .34 | .22 | 1.11 |
| 12/31/09 | .13 | .27 | .67 | .12 | 1.19 |
| 12/31/10 | .12 | .27 | .54 | .20 | 1.13 |
| 12/31/11 | .26 | .40 | ***.45*** | ***.18*** | |
| 12/31/12 | ***.21*** | | | | |

| Cal-endar | QUARTERLY DIVIDENDS PAID 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 2008 | .218 | .218 | .222 | .222 | .88 |
| 2009 | .222 | .222 | .228 | .228 | .90 |
| 2010 | .228 | .228 | .233 | .233 | .92 |
| 2011 | .233 | .233 | .238 | | |

### INSTITUTIONAL DECISIONS

| | 4Q'10 | 1Q'11 | 2Q'11 |
|---|---|---|---|
| to Buy | 27 | 25 | 21 |
| to Sell | 19 | 19 | 27 |
| Hld's(000) | 2764 | 2769 | 2720 |

| ASSETS ($mill.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 5.4 | 1.0 | .8 |
| Receivables | 6.5 | 10.1 | 16.4 |
| Inventory (Avg cost) | 1.1 | 1.7 | 1.2 |
| Other | 7.0 | 7.6 | 2.0 |
| Current Assets | 20.0 | 20.4 | 20.4 |
| Property, Plant & Equip, at cost | 448.2 | 471.6 | - - |
| Accum Depreciation | 123.0 | 127.4 | - - |
| Net Property | 325.2 | 344.2 | 355.1 |
| Other | 70.1 | 60.6 | 55.2 |
| Total Assets | 415.3 | 425.2 | 430.7 |
| **LIABILITIES ($mill.)** | | | |
| Accts Payable | 6.5 | 6.6 | 6.8 |
| Debt Due | 25.0 | 26.3 | 26.4 |
| Other | 1.6 | 2.2 | 1.5 |
| Current Liab | 33.1 | 35.1 | 34.7 |

**LONG-TERM DEBT AND EQUITY as of 6/30/11**

**Total Debt** $137.8 mill. **Due in 5 Yrs.** NA
**LT Debt** $111.4 mill.
**Including Cap. Leases** NA (49% of Cap'l)

**Leases, Uncapitalized** Annual rentals NA

**Pension Liability** $16.7 mill. in '10 vs. $14.9 mill. in '09

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

**Common Stock** 8,722,000 shares (51% of Cap'l)

## INDUSTRY: Water Utility

**BUSINESS:** Connecticut Water Service, Inc. primarily operates as a water utility provider. The company operates through three segments: Water Activities, Real Estate Transactions, and Services and Rentals. The Water Activities segment supplies public drinking water to its customers. Its 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 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 August 9, 2011 the company provided drinking water to approximately 90,000 customers or 300,000 people in 55 towns. Has 204 employees. Chairman, C.E.O. & President: Eric W. Thornburg. Inc.: CT. Address: 93 West Main Street, Clinton, CT 06413. Tel.: (860) 669-8636. Internet: http://www.ctwater.com.

*J.V.*

*October 21, 2011*

### TOTAL SHAREHOLDER RETURN

*Dividends plus appreciation as of 9/30/2011*

| 3 Mos. | 6 Mos. | 1 Yr. | 3 Yrs. | 5 Yrs. |
|---|---|---|---|---|
| -1.33% | -3.32% | 8.33% | -2.74% | 36.93% |

# MIDDLESEX WATER NDQ-MSEX

RECENT PRICE 17.94 | P/E RATIO 19.1 (Trailing: 19.1 Median: 23.0) | RELATIVE P/E RATIO 1.39 | DIV'D YLD 4.1% | VALUE LINE

TIMELINESS 3 New 10/21/11
SAFETY 2 New 10/21/11
TECHNICAL 3 New 10/21/11
BETA .75 (1.00 = Market)

**2014-16 PROJECTIONS**

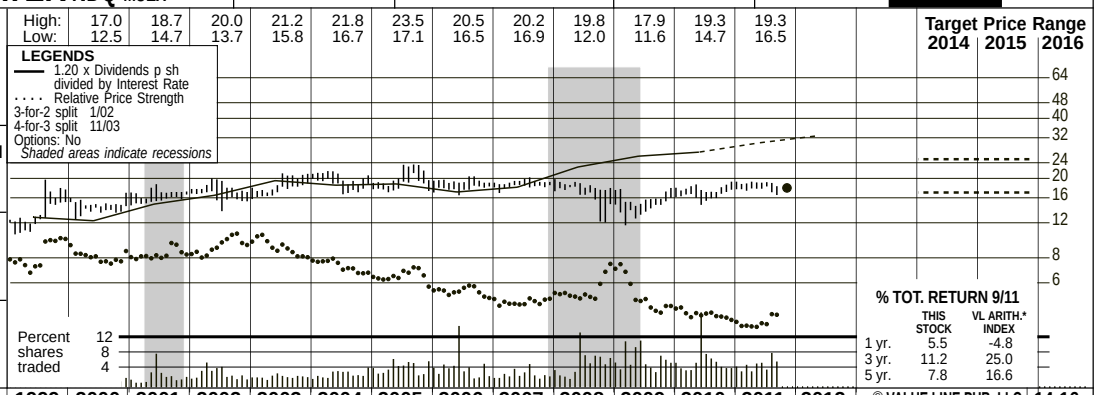
| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 25 | (+40%) | *12%* |
| Low | 17 | (-5%) | *3%* |

**Insider Decisions**

| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| 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 | 1 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 39 | 25 | 31 |
| to Sell | 21 | 25 | 24 |
| Hld's(000) | 6031 | 6200 | 6377 |




**% TOT. RETURN 9/11**

| | THIS STOCK | VL ARITH.* INDEX |
|---|---|---|
| 1 yr. | 5.5 | -4.8 |
| 3 yr. | 11.2 | 25.0 |
| 5 yr. | 7.8 | 16.6 |

| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | © VALUE LINE PUB. LLC | 14-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.56 | 4.52 | 4.72 | 4.39 | 5.35 | 5.39 | 5.87 | 5.98 | 6.12 | 6.25 | 6.44 | 6.16 | 6.50 | 6.79 | 6.75 | 6.60 | *6.75* | *6.90* | Revenues per sh | *8.25* |
| 1.01 | .94 | 1.02 | 1.02 | 1.19 | .99 | 1.18 | 1.20 | 1.15 | 1.28 | 1.33 | 1.33 | 1.49 | 1.53 | 1.40 | 1.55 | *1.60* | *1.70* | "Cash Flow" per sh | *2.00* |
| .68 | .60 | .67 | .71 | .76 | .51 | .66 | .73 | .61 | .73 | .71 | .82 | .87 | .89 | .72 | .96 | *.93* | *1.00* | Earnings per sh [A] | *1.20* |
| .54 | .55 | .57 | .58 | .60 | .61 | .62 | .63 | .65 | .66 | .67 | .68 | .69 | .70 | .71 | .72 | *.73* | *.74* | Div'd Decl'd per sh [B]■ | *.80* |
| 1.08 | .73 | 1.20 | 2.68 | 2.33 | 1.32 | 1.25 | 1.59 | 1.87 | 2.54 | 2.18 | 2.31 | 1.66 | 2.12 | 1.49 | 1.90 | *1.50* | *1.55* | Cap'l Spending per sh | *1.75* |
| 5.74 | 5.85 | 6.00 | 6.80 | 6.95 | 6.98 | 7.11 | 7.39 | 7.60 | 8.02 | 8.26 | 9.52 | 10.05 | 10.03 | 10.33 | 11.13 | *11.15* | *11.25* | Book Value per sh | *11.75* |
| 8.30 | 8.41 | 8.54 | 9.82 | 10.00 | 10.11 | 10.17 | 10.36 | 10.48 | 11.36 | 11.58 | 13.17 | 13.25 | 13.40 | 13.52 | 15.57 | *15.70* | *16.00* | Common Shs Outst'g [C] | *17.00* |
| 12.2 | 14.4 | 13.4 | 15.2 | 17.6 | 28.7 | 24.6 | 23.5 | 30.0 | 26.4 | 27.4 | 22.7 | 21.6 | 19.8 | 21.0 | 17.8 | *Bold figures are Value Line estimates* | | Avg Ann'l P/E Ratio | *17.0* |
| .82 | .90 | .77 | .79 | 1.00 | 1.87 | 1.26 | 1.28 | 1.71 | 1.39 | 1.46 | 1.23 | 1.15 | 1.19 | 1.40 | 1.13 | | | Relative P/E Ratio | *1.15* |
| 6.5% | 6.4% | 6.3% | 5.4% | 4.4% | 4.2% | 3.8% | 3.7% | 3.5% | 3.4% | 3.5% | 3.7% | 3.7% | 4.0% | 4.7% | 4.2% | | | Avg Ann'l Div'd Yield | *3.6%* |
| | | | | | | 59.6 | 61.9 | 64.1 | 71.0 | 74.6 | 81.1 | 86.1 | 91.0 | 91.2 | 102.7 | *106* | *110* | Revenues ($mill) | *140* |
| | | | | | | 7.0 | 7.8 | 6.6 | 8.4 | 8.5 | 10.0 | 11.8 | 12.2 | 10.0 | 14.3 | *15.0* | *16.0* | Net Profit ($mill) | *21.0* |
| | | | | | | 34.8% | 33.3% | 32.8% | 31.1% | 27.6% | 33.4% | 32.6% | 33.2% | 34.1% | 32.1% | *32.0%* | *32.0%* | Income Tax Rate | *32.0%* |
| | | | | | | 7.4% | 7.2% | 7.5% | 7.3% | 7.5% | 7.5% | 7.5% | 7.7% | 7.7% | 7.5% | *7.5%* | *7.5%* | AFUDC % to Net Profit | *7.0%* |
| | | | | | | 53.6% | 52.1% | 53.8% | 53.8% | 55.3% | 49.5% | 49.0% | 45.6% | 46.6% | 43.1% | *43.0%* | *43.0%* | Long-Term Debt Ratio | *42.0%* |
| | | | | | | 43.9% | 45.5% | 44.0% | 42.5% | 41.3% | 47.5% | 49.6% | 51.8% | 52.1% | 55.8% | *56.0%* | *55.0%* | Common Equity Ratio | *56.0%* |
| | | | | | | 164.5 | 168.0 | 181.1 | 214.5 | 231.7 | 264.0 | 268.8 | 259.4 | 267.9 | 310.5 | *315* | *325* | Total Capital ($mill) | *375* |
| | | | | | | 199.1 | 211.4 | 230.9 | 262.9 | 288.0 | 317.1 | 333.9 | 366.3 | 376.5 | 405.9 | *425* | *460* | Net Plant ($mill) | *550* |
| | | | | | | 5.6% | 6.0% | 5.0% | 5.1% | 5.0% | 5.1% | 5.6% | 5.8% | 5.0% | 5.7% | *5.0%* | *5.0%* | Return on Total Cap'l | *5.5%* |
| | | | | | | 9.1% | 9.6% | 7.9% | 8.5% | 8.2% | 7.5% | 8.6% | 8.6% | 7.0% | 8.1% | *8.5%* | *8.5%* | Return on Shr. Equity | *10.5%* |
| | | | | | | 9.3% | 9.8% | 8.0% | 9.0% | 8.6% | 7.8% | 8.7% | 8.9% | 7.0% | 8.2% | *8.5%* | *8.5%* | Return on Com Equity | *10.5%* |
| | | | | | | .5% | 1.3% | NMF | .9% | .6% | 1.3% | 1.8% | 2.0% | .1% | 2.1% | *2.0%* | *2.0%* | Retained to Com Eq | *3.5%* |
| | | | | | | 94% | 87% | 106% | 90% | 94% | 84% | 79% | 78% | 98% | 75% | *78%* | *74%* | All Div'ds to Net Prof | *67%* |

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $139.1 mill. **Due in 5 Yrs** $25.0 mill.
**LT Debt** $134.7 mill. **LT Interest** $6.0 mill.
(LT interest coverage: 4.5x)
(43% of Cap'l)

**Pension Assets-12/10** $30.0 mill.
**Oblig.** $42.1 mill.
**Pfd Stock** 3.4 mill. **Pfd Div'd:** .1 mill.

**Common Stock** 15,618,317 shs.
**as of 8/2/11**

**MARKET CAP: $275 million (Small Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 4.3 | 2.5 | 4.3 |
| Other | 17.7 | 20.3 | 21.2 |
| Current Assets | 22.0 | 22.8 | 25.5 |
| Accts Payable | 4.3 | 6.4 | 5.7 |
| Debt Due | 3.7 | 4.4 | 4.4 |
| Other | 52.7 | 29.9 | 33.6 |
| Current Liab. | 60.7 | 40.7 | 43.7 |
| Fix. Chg. Cov. | 325% | 400% | 415% |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | 3.0% | 1.5% | *3.5%* |
| "Cash Flow" | 3.5% | 3.5% | *5.0%* |
| Earnings | 2.5% | 4.5% | *6.0%* |
| Dividends | 2.0% | 1.5% | *2.0%* |
| Book Value | 4.5% | 5.5% | *2.0%* |

| Calendar | QUARTERLY REVENUES ($ mill.) Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 20.8 | 23.0 | 25.7 | 21.5 | 91.0 |
| 2009 | 20.6 | 23.1 | 25.5 | 22.0 | 91.2 |
| 2010 | 21.6 | 26.5 | 29.6 | 25.0 | 102.7 |
| 2011 | 24.0 | 26.1 | *30.0* | *25.9* | *106* |
| 2012 | *25.0* | *27.0* | *31.0* | *27.0* | *110* |

| Calendar | EARNINGS PER SHARE [A] Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .15 | .26 | .35 | .13 | .89 |
| 2009 | .10 | .21 | .29 | .12 | .72 |
| 2010 | .11 | .31 | .37 | .17 | .96 |
| 2011 | .17 | .23 | *.35* | *.18* | *.93* |
| 2012 | *.18* | *.25* | *.37* | *.20* | *1.00* |

| Calendar | QUARTERLY DIVIDENDS PAID [B]■ Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | .173 | .173 | .173 | .175 | .69 |
| 2008 | .175 | .175 | .175 | .178 | .70 |
| 2009 | .178 | .178 | .178 | .180 | .71 |
| 2010 | .180 | .180 | .180 | .183 | .72 |
| 2011 | .183 | .183 | .183 | | |

**BUSINESS:** Middlesex Water Company engages in the ownership and operation of regulated water utility systems in New Jersey, Delaware, and Pennsylvania. It also operates water and wastewater systems under contract on behalf of municipal and private clients in NJ and DE. Its Middlesex System provides water services to 60,000 retail customers, primarily in Middlesex County, New Jersey. in 2010, the Middlesex System accounted for 64% of total revenues. At 12/31/10, the company had 292 employees. Incorporated: NJ. President, CEO, and Chairman: Dennis W. Doll. Officers/directors own 3.39% of the common stock; BlackRock, 7.0%; The Vanguard Group, 5.0% (4/11 proxy). Address: 1500 Ronson Road, Iselin, NJ 08830. Tel.: 732-634-1500. Internet: www.middlesexwater.com.

**We welcome Middlesex Water Company to *The Value Line Investment Survey*.** The company was incorporated in 1897, and offers regulated water services to residential and commercial customers in New Jersey, Delaware, and Pennsylvania. It also owns and operates nonregulated wastewater systems. The bulk of its revenues comes from the Middlesex System, which provides water services to about 60,000 customers in New Jersey.

**The company's near- and long-term prospects aren't compelling.** It has a number of rate cases that are awaiting disposition. Most recently, in order to recoup expenses that stemmed from elevated maintenance outlays, it submitted a request to the Delaware Public Service Commission for an increase in base water rates of $6.9 million. Several rate case rulings are expected over the next year or so, and approvals will help advance revenues and share net. Furthermore, and most important, water is one of, if not the most, essential part of life. Water providers, therefore, are almost as critical, and demand for water ought to continue to grow along with the population. However, in order to keep the water flowing, Middlesex will have to invest heavily in repairing and improving its infrastructure, which will hamper the bottom line. All told, we project that annual share earnings will advance at just a mid-single-digit rate to 2014–2016.

**That said, we believe that this stock may appeal to some conservative, income-oriented investors.** The consistentcy of its business allows for the stock to largely avoid sharp price swings during uncertain economic times. Its Beta is 0.75, and the equity carries a Safety Rank of 2 (Above Average). In addition, compared to the other water utilities under *Value Line* coverage, Middlesex offers the highest dividend yield (recently 4.1%), and the payout appears secure. In fact, the company has paid a dividend every year since 1912. However, investors that are more interested in price appreciation need not apply here. Middlesex stock typically trades in a tight band, and already is priced at the low end of our projected Target Price Range for 2014–2016. It is also just ranked 3 (Average) for Timeliness.

*Ian Gendler* *October 21, 2011*

**(A)** Diluted earnings. Next earnings report due early November.

**(B)** Dividends historically paid in mid-Fed., May, Aug., and November.■ Div'd reinvestment plan available.

**(C)** In millions, adjusted for splits.

| | |
|---|---|
| Company's Financial Strength | B+ |
| Stock's Price Stability | 95 |
| Price Growth Persistence | 30 |
| Earnings Predictability | 85 |

# SJW CORP. NYSE-SJW

RECENT PRICE **23.38** | P/E RATIO **22.9** (Trailing: 26.9 Median: 22.0) | RELATIVE P/E RATIO **1.67** | DIV'D YLD **3.0%** | **VALUE LINE**

**TIMELINESS** 3 Raised 8/12/11
**SAFETY** 3 New 4/22/11
TECHNICAL 3 Lowered 9/30/11
**BETA** .90 (1.00 = Market)

**2014-16 PROJECTIONS**

| | Price | Gain | Ann'l Total Return |
|---|---|---|---|
| High | 40 | (+70%) | *17%* |
| Low | 30 | (+30%) | *9%* |

**Insider Decisions**

| | N | D | J | F | M | A | M | J | J |
|---|---|---|---|---|---|---|---|---|---|
| to Buy | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| Options | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| to Sell | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

**Institutional Decisions**

| | 4Q2010 | 1Q2011 | 2Q2011 |
|---|---|---|---|
| to Buy | 34 | 26 | 31 |
| to Sell | 26 | 34 | 28 |
| Hld's(000) | 8640 | 8648 | 8839 |

| | High: | 20.3 | 17.8 | 15.1 | 15.0 | 19.6 | 27.8 | 45.3 | 43.0 | 35.1 | 30.4 | 28.2 | 26.8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low: | 15.8 | 11.6 | 12.7 | 12.6 | 14.6 | 16.1 | 21.2 | 27.7 | 20.0 | 18.2 | 21.6 | 20.9 |

**LEGENDS**
1.50 x Dividends p sh divided by Interest Rate
Relative Price Strength
3-for-1 split 3/04
2-for-1 split 3/06
Options: No
*Shaded areas indicate recessions*

Percent shares traded: 21, 14, 7

**Target Price Range** 2014 | 2015 | 2016

**% TOT. RETURN 9/11**

| | THIS STOCK | VL ARITH.* INDEX |
|---|---|---|
| 1 yr. | -9.0 | -4.8 |
| 3 yr. | -20.9 | 25.0 |
| 5 yr. | -17.5 | 16.6 |

| 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | © VALUE LINE PUB. LLC | 14-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4.99 | 5.39 | 5.79 | 5.58 | 6.40 | 6.74 | 7.45 | 7.97 | 8.20 | 9.14 | 9.86 | 10.35 | 11.25 | 12.12 | 11.68 | 11.62 | ***12.65*** | ***12.50*** | Revenues per sh | ***13.35*** |
| .98 | 1.43 | 1.27 | 1.26 | 1.43 | 1.23 | 1.49 | 1.55 | 1.75 | 1.89 | 2.21 | 2.38 | 2.30 | 2.44 | 2.21 | 2.37 | ***2.60*** | ***2.70*** | "Cash Flow" per sh | ***3.00*** |
| .59 | .96 | .80 | .76 | .87 | .58 | .77 | .78 | .91 | .87 | 1.12 | 1.19 | 1.04 | 1.08 | .81 | .84 | ***1.00*** | ***1.10*** | Earnings per sh [A] | ***1.40*** |
| .35 | .37 | .38 | .39 | .40 | .41 | .43 | .46 | .49 | .51 | .53 | .57 | .61 | .65 | .66 | .68 | ***.69*** | ***.74*** | Div'd Decl'd per sh [B■] | ***.82*** |
| .96 | 1.06 | 1.27 | 1.81 | 1.77 | 1.89 | 2.63 | 2.06 | 3.41 | 2.31 | 2.83 | 3.87 | 6.62 | 3.79 | 3.17 | 5.65 | ***3.80*** | ***3.75*** | Cap'l Spending per sh | ***4.45*** |
| 5.58 | 6.31 | 7.02 | 7.53 | 7.88 | 7.90 | 8.17 | 8.40 | 9.11 | 10.11 | 10.72 | 12.48 | 12.90 | 13.99 | 13.66 | 13.75 | ***13.70*** | ***14.25*** | Book Value per sh | ***16.20*** |
| 19.50 | 19.02 | 19.02 | 19.01 | 18.27 | 18.27 | 18.27 | 18.27 | 18.27 | 18.27 | 18.27 | 18.28 | 18.36 | 18.18 | 18.50 | 18.55 | ***18.60*** | ***20.00*** | Common Shs Outst'g [C] | ***22.50*** |
| 9.9 | 6.8 | 11.2 | 13.1 | 15.5 | 33.1 | 18.5 | 17.3 | 15.4 | 19.6 | 19.7 | 23.5 | 33.4 | 26.2 | 28.7 | 29.5 | *Bold figures are Value Line estimates* | | Avg Ann'l P/E Ratio | ***25.0*** |
| .66 | .43 | .65 | .68 | .88 | 2.15 | .95 | .94 | .88 | 1.04 | 1.05 | 1.27 | 1.77 | 1.58 | 1.91 | 1.89 | | | Relative P/E Ratio | ***1.65*** |
| 6.0% | 5.7% | 4.3% | 3.9% | 3.0% | 2.1% | 3.0% | 3.4% | 3.5% | 3.0% | 2.4% | 2.0% | 1.7% | 2.3% | 2.8% | 2.8% | | | Avg Ann'l Div'd Yield | ***2.5%*** |
| 136.1 | 145.7 | 149.7 | 166.9 | 180.1 | 189.2 | 206.6 | 220.3 | 216.1 | 215.6 | ***235*** | ***250*** | Revenues ($mill) | ***300*** |
| 14.0 | 14.2 | 16.7 | 16.0 | 20.7 | 22.2 | 19.3 | 20.2 | 15.2 | 15.6 | ***18.5*** | ***22.0*** | Net Profit ($mill) | ***30.0*** |
| 34.5% | 40.4% | 36.2% | 42.1% | 41.6% | 40.8% | 39.4% | 39.5% | 40.4% | 39.7% | ***40.0%*** | ***40.0%*** | Income Tax Rate | ***39.0%*** |
| 4.4% | 4.2% | 1.6% | 2.1% | 1.6% | 2.1% | 2.7% | 2.3% | 2.0% | 3.6% | ***5.0%*** | ***5.0%*** | AFUDC % to Net Profit | ***5.0%*** |
| 42.4% | 41.7% | 45.6% | 43.7% | 42.6% | 41.8% | 47.7% | 46.0% | 49.4% | 53.7% | ***57.5%*** | ***55.0%*** | Long-Term Debt Ratio | ***48.5%*** |
| 57.6% | 58.3% | 54.4% | 56.3% | 57.4% | 58.2% | 52.3% | 54.0% | 50.6% | 46.3% | ***42.5%*** | ***45.0%*** | Common Equity Ratio | ***51.5%*** |
| 259.4 | 263.5 | 306.0 | 328.3 | 341.2 | 391.8 | 453.2 | 470.9 | 499.6 | 550.7 | ***600*** | ***635*** | Total Capital ($mill) | ***755*** |
| 367.8 | 390.8 | 428.5 | 456.8 | 484.8 | 541.7 | 645.5 | 684.2 | 718.5 | 785.5 | ***815*** | ***860*** | Net Plant ($mill) | ***1000*** |
| 6.7% | 6.9% | 6.9% | 6.5% | 7.6% | 7.0% | 5.7% | 5.8% | 4.4% | 4.2% | ***4.5%*** | ***5.0%*** | Return on Total Cap'l | ***5.5%*** |
| 9.4% | 9.3% | 10.0% | 8.7% | 10.6% | 9.7% | 8.2% | 8.0% | 6.0% | 6.1% | ***7.5%*** | ***7.5%*** | Return on Shr. Equity | ***8.0%*** |
| 9.4% | 9.3% | 10.0% | 8.7% | 10.6% | 9.7% | 8.2% | 8.0% | 6.0% | 6.1% | ***7.5%*** | ***7.5%*** | Return on Com Equity | ***8.0%*** |
| 4.1% | 3.8% | 4.7% | 3.6% | 5.6% | 5.2% | 3.5% | 3.3% | 1.2% | 1.2% | ***2.0%*** | ***2.5%*** | Retained to Com Eq | ***3.0%*** |
| 56% | 59% | 53% | 58% | 47% | 46% | 57% | 59% | 80% | 81% | ***69%*** | ***67%*** | All Div'ds to Net Prof | ***62%*** |

**CAPITAL STRUCTURE as of 6/30/11**
**Total Debt** $352.7 mill. **Due in 5 Yrs** $64.3 mill.
**LT Debt** $344.8 mill. **LT Interest** $17.0 mill.
(LT interest earned: 3.2x: total interest coverage: 3.0x) (57% of Cap'l)

**Leases, Uncapitalized:** Annual rentals $4.2 mill.

**Pension Assets-12/10** $10.8 mill.
**Oblig.** $58.8 mill.
**Pfd Stock** None.

**Common Stock** 18,577,630 shs.
**as of 7/21/11**
**MARKET CAP: $425 million (Small Cap)**

| CURRENT POSITION ($MILL.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | 1.4 | 1.7 | 45.4 |
| Other | 26.6 | 36.3 | 38.4 |
| Current Assets | 28.0 | 38.0 | 83.8 |
| Accts Payable | 6.6 | 5.5 | 9.8 |
| Debt Due | 6.9 | 5.1 | 7.9 |
| Other | 18.5 | 18.6 | 21.7 |
| Current Liab. | 32.0 | 29.2 | 39.4 |
| Fix. Chg. Cov. | 352% | 400% | *250%* |

| ANNUAL RATES of change (per sh) | Past 10 Yrs. | Past 5 Yrs. | Est'd '08-'10 to '14-'16 |
|---|---|---|---|
| Revenues | 6.5% | 5.5% | *2.0%* |
| "Cash Flow" | 6.0% | 3.5% | *4.0%* |
| Earnings | 2.0% | -1.5% | *7.5%* |
| Dividends | 5.0% | 5.5% | *3.5%* |
| Book Value | 6.0% | 6.5% | *2.5%* |

| Calendar | QUARTERLY REVENUES ($ mill.) Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | 41.3 | 60.0 | 69.5 | 49.5 | 220.3 |
| 2009 | 40.0 | 58.2 | 69.3 | 48.6 | 216.1 |
| 2010 | 40.4 | 54.1 | 70.3 | 50.8 | 215.6 |
| 2011 | 43.7 | 59.0 | ***77.3*** | ***55.0*** | ***235*** |
| 2012 | ***47.0*** | ***63.0*** | ***82.0*** | ***58.0*** | ***250*** |

| Calendar | EARNINGS PER SHARE [A] Mar.31 | Jun. 30 | Sep. 30 | Dec. 31 | Full Year |
|---|---|---|---|---|---|
| 2008 | .15 | .34 | .44 | .15 | 1.08 |
| 2009 | .01 | .23 | .43 | .14 | .81 |
| 2010 | .05 | .24 | .44 | .11 | .84 |
| 2011 | .03 | .29 | ***.54*** | ***.14*** | ***1.00*** |
| 2012 | ***.05*** | ***.32*** | ***.57*** | ***.16*** | ***1.10*** |

| Calendar | QUARTERLY DIVIDENDS PAID [B■] Mar.31 | Jun.30 | Sep.30 | Dec.31 | Full Year |
|---|---|---|---|---|---|
| 2007 | .15 | .15 | .15 | .15 | .60 |
| 2008 | .16 | .16 | .16 | .16 | .64 |
| 2009 | .165 | .165 | .165 | .165 | .66 |
| 2010 | .17 | .17 | .17 | .17 | .68 |
| 2011 | .173 | .173 | .173 | | |

**BUSINESS:** SJW Corporation engages in the production, purchase, storage, purification, distribution, and retail sale of water. It provides water service to approximately 226,000 connections that serve a population of approximately one million people in the San Jose area and 8,700 connections that serve approximately 36,000 residents in a service area in the region between San Antonio and Austin, Texas. The company offers nonregulated water-related services, including water system operations, cash remittances, and maintenance contract services. SJW also owns and operates commercial real estate investments. Has 375 employees. Chairman: Charles J. Toeniskoetter. Inc.: CA. Address: 110 W. Taylor Street, San Jose, CA 95110. Tel.: (408) 279-7800. Int:www.sjwater.com.

**Rate increases are really helping SJW Corp ...** Indeed, the water utility got earnings growth back on track in the second quarter, thanks largely to a double-digit top-line gain.

**... and are likely to continue making a splash going forward, too.** We've increased our second-half and 2012 estimates to account for the added benefits of recent regulatory help. Our estimates may well prove light if favorable rulings, which we are not anticipating at this time, continue rolling in.

**However, operating costs are also likely to continue to mount.** Water distribution is held to many rigorous state and federal standards. Meanwhile, the majority of pipelines and wastewater systems are old and require serious attention. As a result, operating costs are expected to remain on an upward trajectory, thus limiting any of the aforementioned rate case improvements. SJW, in the meantime, is not exactly flush with cash, despite a recent debt offering. We suspect that similar share and/or debt offerings will be required in order to foot the bill, thereby further diluting future gains.

**The stock has been doing relatively well lately.** It has held its ground for the most part since our July review, despite the volatility that has wreaked havoc on many outside the water utility industry.

**But it still does not stand out in any capacity in our opinion.** Although the water utility space is appealing at this time, investors have better growth and income-producing vehicles to choose from. It is an average selection in both regards, and also lacks 3- to 5-year appreciation potential, due to the capital constraints that it is under and the costs of doing business that are likely to continue to swell. Financial limitations are also precluding the company from going out and making a splash in the acquisition market. The industry is highly fragmented, and there exists great opportunity to further build out the business model via expansion into new territories. A highly leveraged balance sheet and a dearth of cash on hand, however, make such an undertaking highly unlikely, and, worse yet, raise some concerns over the sustainability of the dividend if something doesn't give.

*Andre J. Costanza* *October 21, 2011*

**(A)** Diluted earnings. Excludes nonrecurring losses : '03, $1.97; '04, $3.78; '05, $1.09; '06, $16.36; '08, $1.22; '10, 46¢. Next earnings report due late Oct. Quarterly egs. may not add due to rounding.
**(B)** Dividends historically paid in early March, June, September, and December. ■ Div'd reinvestment plan available.
**(C)** In millions.

| | |
|---|---|
| **Company's Financial Strength** | B+ |
| **Stock's Price Stability** | 70 |
| **Price Growth Persistence** | 75 |
| **Earnings Predictability** | 85 |

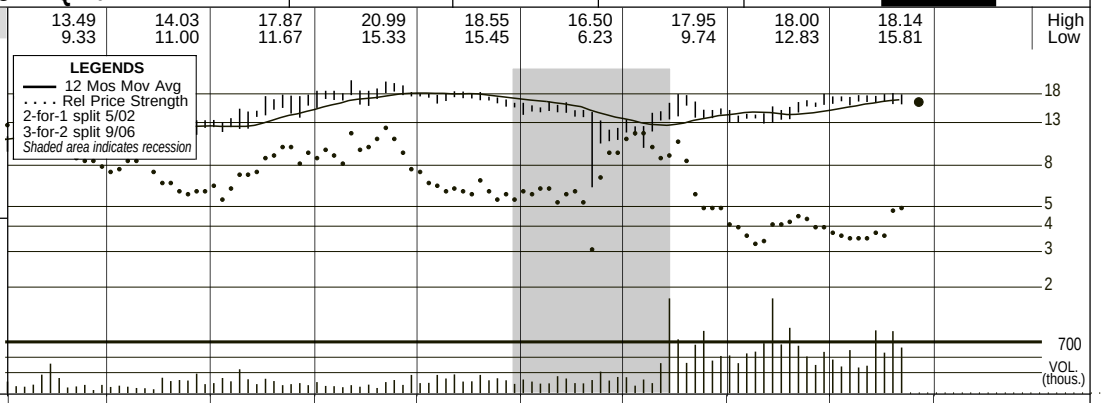
# YORK WATER CO NDQ--YORW

RECENT PRICE 16.40 | TRAILING P/E RATIO 22.2 | RELATIVE P/E RATIO 1.46 | DIV'D YLD 3.2% | VALUE LINE

## RANKS

PERFORMANCE 3 Average
Technical 3 Average
SAFETY 2 Above Average
BETA .70 (1.00 = Market)

Financial Strength B++
Price Stability 95
Price Growth Persistence 70
Earnings Predictability 100




| © VALUE LINE PUBLISHING LLC | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012/2013 |
|---|---|---|---|---|---|---|---|---|---|---|
| REVENUES PER SH | 2.17 | 2.18 | 2.58 | 2.56 | 2.79 | 2.89 | 2.95 | 3.07 | -- | |
| "CASH FLOW" PER SH | .65 | .65 | .79 | .77 | .86 | .88 | .95 | 1.07 | -- | |
| EARNINGS PER SH | .47 | .49 | .56 | .58 | .57 | .57 | .64 | .71 | ***.75*** [A,B] | ***.80*** [C]***/NA*** |
| DIV'D DECL'D PER SH | .37 | .39 | .42 | .45 | .48 | .49 | .51 | .52 | -- | |
| CAP'L SPENDING PER SH | 1.07 | 2.50 | 1.69 | 1.85 | 1.69 | 2.17 | 1.18 | .83 | -- | |
| BOOK VALUE PER SH | 4.06 | 4.65 | 4.85 | 5.84 | 5.97 | 6.14 | 6.92 | 7.19 | -- | |
| COMMON SHS OUTST'G (MILL) | 9.63 | 10.33 | 10.40 | 11.20 | 11.27 | 11.37 | 12.56 | 12.69 | -- | |
| AVG ANN'L P/E RATIO | 24.5 | 25.7 | 26.3 | 31.2 | 30.3 | 24.6 | 21.9 | 20.7 | ***21.9*** | ***20.5/NA*** |
| RELATIVE P/E RATIO | 1.40 | 1.36 | 1.39 | 1.68 | 1.61 | 1.48 | 1.46 | 1.32 | -- | |
| AVG ANN'L DIV'D YIELD | 3.2% | 3.1% | 2.9% | 2.5% | 2.8% | 3.5% | 3.6% | 3.5% | -- | |
| REVENUES ($MILL) | 20.9 | 22.5 | 26.8 | 28.7 | 31.4 | 32.8 | 37.0 | 39.0 | -- | ***Bold figures are consensus earnings estimates and, using the recent prices, P/E ratios.*** |
| NET PROFIT ($MILL) | 4.4 | 4.8 | 5.8 | 6.1 | 6.4 | 6.4 | 7.5 | 8.9 | -- | |
| INCOME TAX RATE | 34.8% | 36.7% | 36.7% | 34.4% | 36.5% | 36.1% | 37.9% | 38.5% | -- | |
| AFUDC % TO NET PROFIT | -- | -- | -- | 7.2% | 3.6% | 10.1% | -- | 1.2% | -- | |
| LONG-TERM DEBT RATIO | 43.4% | 42.5% | 44.1% | 48.3% | 46.5% | 54.5% | 45.7% | 48.3% | -- | |
| COMMON EQUITY RATIO | 56.6% | 57.5% | 55.9% | 51.7% | 53.5% | 45.5% | 54.3% | 51.7% | -- | |
| TOTAL CAPITAL ($MILL) | 69.0 | 83.6 | 90.3 | 126.5 | 125.7 | 153.4 | 160.1 | 176.4 | -- | |
| NET PLANT ($MILL) | 116.5 | 140.0 | 155.3 | 174.4 | 191.6 | 211.4 | 222.0 | 228.4 | -- | |
| RETURN ON TOTAL CAP'L | 8.5% | 7.6% | 8.4% | 6.2% | 6.7% | 5.7% | 6.2% | 6.5% | -- | |
| RETURN ON SHR. EQUITY | 11.4% | 10.0% | 11.6% | 9.3% | 9.5% | 9.2% | 8.6% | 9.8% | -- | |
| RETURN ON COM EQUITY | 11.4% | 10.0% | 11.6% | 9.3% | 9.5% | 9.2% | 8.6% | 9.8% | -- | |
| RETAINED TO COM EQ | 2.6% | 2.1% | 3.0% | 2.2% | 1.7% | 1.4% | 1.9% | 2.7% | -- | |
| ALL DIV'DS TO NET PROF | 77% | 79% | 74% | 77% | 82% | 85% | 78% | 72% | -- | |

[A]*No. of analysts changing earn. est. in last 8 days: 0 up, 0 down, consensus 5-year earnings growth not available.* [B]*Based upon 4 analysts' estimates.* [C]*Based upon 4 analysts' estimates.*

### ANNUAL RATES

| *of change (per share)* | 5 Yrs. | 1 Yr. |
|---|---|---|
| Revenues | 5.0% | 4.0% |
| "Cash Flow" | 7.0% | 12.0% |
| Earnings | 5.0% | 11.0% |
| Dividends | 5.0% | 2.0% |
| Book Value | 8.5% | 4.0% |

### QUARTERLY SALES ($mill.)

| Fiscal Year | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/09 | 8.8 | 9.2 | 9.8 | 9.2 | 37.0 |
| 12/31/10 | 9.0 | 9.7 | 10.5 | 9.8 | 39.0 |
| 12/31/11 | 9.6 | 10.5 | | | |
| 12/31/12 | | | | | |

### EARNINGS PER SHARE

| Fiscal Year | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 12/31/08 | .11 | .13 | .15 | .18 | .57 |
| 12/31/09 | .13 | .17 | .18 | .16 | .64 |
| 12/31/10 | .15 | .18 | .21 | .17 | .71 |
| 12/31/11 | .17 | .19 | ***.21*** | ***.18*** | |
| 12/31/12 | ***.17*** | | | | |

### QUARTERLY DIVIDENDS PAID

| Cal-endar | 1Q | 2Q | 3Q | 4Q | Full Year |
|---|---|---|---|---|---|
| 2008 | .121 | .121 | .121 | .121 | .48 |
| 2009 | .126 | .126 | .126 | .126 | .50 |
| 2010 | .128 | .128 | .128 | .128 | .51 |
| 2011 | .131 | .131 | .131 | .131 | |

### INSTITUTIONAL DECISIONS

| | 4Q'10 | 1Q'11 | 2Q'11 |
|---|---|---|---|
| to Buy | 25 | 20 | 27 |
| to Sell | 16 | 21 | 21 |
| Hld's(000) | 3107 | 3080 | 3163 |

| ASSETS ($mill.) | 2009 | 2010 | 6/30/11 |
|---|---|---|---|
| Cash Assets | .0 | 1.3 | 3.1 |
| Receivables | 5.4 | 6.3 | 6.1 |
| Inventory (Avg cost) | .7 | .6 | .7 |
| Other | 1.0 | .6 | 1.5 |
| Current Assets | 7.1 | 8.8 | 11.4 |
| Property, Plant & Equip, at cost | 260.4 | 270.8 | - - |
| Accum Depreciation | 38.4 | 42.4 | - - |
| Net Property | 222.0 | 228.4 | 230.2 |
| Other | 19.7 | 22.7 | 23.2 |
| Total Assets | 248.8 | 259.9 | 264.8 |
| **LIABILITIES ($mill.)** | | | |
| Accts Payable | 1.4 | 1.2 | 1.7 |
| Debt Due | 9.3 | .0 | .1 |
| Other | 3.9 | 4.1 | 4.0 |
| Current Liab | 14.6 | 5.3 | 5.8 |

**LONG-TERM DEBT AND EQUITY as of 6/30/11**

**Total Debt** $85.1 mill. **Due in 5 Yrs.** NA
**LT Debt** $85.0 mill.
**Including Cap. Leases** NA (48% of Cap'l)

**Leases, Uncapitalized** Annual rentals NA

**Pension Liability** $9.8 mill. in '10 vs. $8.8 mill. in '09

**Pfd Stock** None **Pfd Div'd Paid** None

**Common Stock** 12,743,000 shares (52% of Cap'l)

## INDUSTRY: Water Utility

**BUSINESS:** The York Water Company engages in the impounding, purification, and distribution of water in York County and Adams County, Pennsylvania. The company supplies water for residential, commercial, industrial, and other customers. It has two reservoirs, Lake Williams, which is 700 feet long and 58 feet high, and creates a reservoir covering approximately 165 acres containing about 870 million gallons of water; and Lake Redman, which is 1,000 feet long and 52 feet high, creating a reservoir covering approximately 290 acres that holds about 1.3 billion gallons of water. In addition, it possesses a 15-mile pipeline from the Susquehanna River to Lake Redman that provides access to an additional supply of water. In August 2011, the company announced it has entered into an agreement to provide water service to Cross Keys Village in Adams County, PA. Cross Keys Village is a continuing-care retirement community currently serving more than 1,500 people on a growing 250-acre campus. Has 110 employees. C.E.O. & President: Jeffrey R. Hines. Inc.: PA. Address: 130 East Market Street, York, PA 17401. Tel.: (717) 845-3601. Internet: http://www.yorkwater.com. *J.V.*

*October 21, 2011*

### TOTAL SHAREHOLDER RETURN

*Dividends plus appreciation as of 9/30/2011*

| 3 Mos. | 6 Mos. | 1 Yr. | 3 Yrs. | 5 Yrs. |
|---|---|---|---|---|
| -1.44% | -5.57% | 4.12% | 44.94% | 0.10% |

United Water Rhode Island, Inc.
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

| Line No. | | Proxy Group of Nine Water Companies |
|---|---|---|
| 1. | Prospective Yield on Aaa Rated Corporate Bonds (1) | 4.37 % |
| 2. | Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds | 0.35 (2) |
| 3. | Adjusted Prospective Yield on A Rated Public Utility Bonds | 4.72 % |
| 4. | Adjustment to Reflect Bond Rating Difference of Proxy Group | 0.18 (3) |
| 5. | Adjusted Prospective Bond Yield | 4.90 |
| 6. | Equity Risk Premium (5) | 5.51 |
| 7. | Risk Premium Derived Common Equity Cost Rate | 10.41 % |

Notes:
(1) Derived in Note (4) on page 18 of this Schedule.
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.35% from page 16 of this Schedule.
(3) Adjustment to reflect the A3 Moody's bond rating of the proxy group of nine water companies as shown on page 15 of this Schedule. The 18 basis point adjustment is derived by taking 1/3 of the spread between Baa2 and A2 Public Utility Bonds (1/3 * 0.52% = 0.18%).
(4) From page 17 of this Schedule.

United Water Rhode Island, Inc.
Comparison of Bond Ratings, Business Risk and Financial Risk Profiles for the
Proxy Group of Nine Water Companies

| | Moody's | | Standard & Poor's | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Bond Rating | | Bond Rating | | | | | | | |
| | October 2011 | | October 2011 | | | | | | | |
| Proxy Group of Nine Water Companies | Bond Rating | Numerical Weighting (1) | Bond Rating | Numerical Weighting (1) | Credit Rating | Numerical Weighting (1) | Business Risk Profile (2) | Numerical Weighting (1) | Financial Risk Profile (2) | Numerical Weighting (1) |
| American States Water Co. (3) | A2 | 6.0 | A+ | 5.0 | A+ | 5.0 | Excellent | 1.0 | Intermediate | 3.0 |
| American Water Works Co., Inc. (4) | Baa1 | 8.0 | A+ | 5.0 | BBB+ | 8.0 | Excellent | 1.0 | Aggressive | 5.0 |
| Aqua America, Inc. (5) | NR | - - | AA- | 4.0 | A+ | 5.0 | Excellent | 1.0 | Intermediate | 3.0 |
| Artesian Resources Corp. | NR | - - | NR | - - | NR | - - | NR | - - | NR | - - |
| California Water Service Group (6) | NR | - - | AA- | 4.0 | A+ | 5.0 | Excellent | 1.0 | Intermediate | 3.0 |
| Connecticut Water Service, Inc. (7) | NR | - - | A | 6.0 | A | 6.0 | Excellent | 1.0 | Intermediate | 3.0 |
| Middlesex Water Company | NR | - - | A | 6.0 | A- | 7.0 | Excellent | 1.0 | Intermediate | 3.0 |
| SJW Corporation (8) | NR | - - | A | 6.0 | A | 6.0 | Excellent | 1.0 | Intermediate | 3.0 |
| York Water Company | NR | - - | A- | 7.0 | A- | 7.0 | Excellent | 1.0 | Intermediate | 3.0 |
| Average | A3 | 7.0 | A+ | 5.4 | | 6.1 | Excellent | 1.0 | Intermediate | 3.3 |

Notes:
(1) From page 3 of Schedule PMA-8 of Ms. Ahern's Direct Testimony.
(2) From Standard & Poor's Issuer Ranking: U.S. Investor-Owned Water Utilities, Strongest to Weakest, October 7, 2011.
(3) Ratings, business risk and financial risk profiles are those of Golden State Water Company.
(4) Rating, business risk and financial risk profiles are those of Pennsylvania and New Jersey American Water.
(5) Ratings, business risk and financial risk profiles are those of Aqua Pennsylvania, In
(6) Ratings, business risk and financial risk profiles are those of California Water Service Co.
(7) Ratings, business risk and financial risk profiles are those of Connecticut Water Company.
(8) Ratings, business risk and financial risk profiles are those of San Jose Water Co.

Source Information: Moody's Investors Service
Standard & Poor's Global Utilities Rating Service

Moody's
Comparison of Interest Rate Trends
for the Three Months Ending September 2011 (1)

| Months | Corporate Bonds Aaa Rated | Public Utility Bonds Aa Rated | Public Utility Bonds A Rated | Public Utility Bonds Baa Rated | Spread - Corporate v. Public Utility Bonds Aa (Pub. Util.) over Aaa (Corp.) | Spread - Corporate v. Public Utility Bonds A (Pub. Util.) over Aaa (Corp.) | Spread - Corporate v. Public Utility Bonds Baa (Pub. Util.) over Aaa (Corp.) | Spread - Public Utility Bonds A over Aa | Spread - Public Utility Bonds Baa over A |
|---|---|---|---|---|---|---|---|---|---|
| September-11 | 4.09 % | 4.24 % | 4.48 % | 5.11 % | | | | | |
| August-11 | 4.37 | 4.44 | 4.69 | 5.22 | | | | | |
| July-11 | 4.93 | 5.05 | 5.27 | 5.70 | | | | | |
| Average of Last 3 Months | 4.46 % | 4.58 % | 4.81 % | 5.34 % | 0.12 % | 0.35 % | 0.88 % | 0.23 % | 0.53 % |

Notes: (1) All yields are distributed yields.

Source of Information: Mergent Bond Record, October 2011, Vol. 78, No. 10.

United Water Rhode Island, Inc.
Judgment of Equity Risk Premium for
the Proxy Group of Nine Water Companies

| Line No. | | Proxy Group of Nine Water Companies |
|---|---|---|
| 1. | Calculated equity risk premium based on the total market using the beta approach (1) | 6.90 % |
| 2. | Mean equity risk premium based on a study using the holding period returns of public utilities with A rated bonds (2) | 4.12 |
| 3. | Average equity risk premium | 5.51 % |

Notes: (1) From page 18 of this Schedule.
(2) From page 19 of this Schedule.

United Water Rhode Island, Inc.
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
the Proxy Group of Nine Water Companies

| Line No. | | Proxy Group of Nine Water Companies |
|---|---|---|
| 1. | Arithmetic mean total return rate on the Standard & Poor's 500 Composite Index - 1926-2010 (1) | 11.90 % |
| 2. | Arithmetic mean yield on Aaa and Aa Corporate Bonds 1926-2010 (2) | (6.10) |
| 3. | Historical Equity Risk Premium | 5.80 % |
| 4. | Forecasted 3-5 year Total Annual Market Return (3) | 18.29 % |
| 5. | Prospective Yield an Aaa Rated Corporate Bonds (4) | (4.37) |
| 6. | Forecasted Equity Risk Premium | 13.92 % |
| 7. | Conclusion of Equity Risk Premium (5) | 9.86 % |
| 8. | Adjusted Value Line Beta (6) | 0.70 |
| 9. | Beta Adjusted Equity Risk Premium | 6.90 % |

Notes:

(1) Ibbotson Associates 2011 Valuation Yearbook - Market Results for 1926-2010, Morningstar, Inc., 2011 Chicago, IL.

(2) From Moody's Industrial Manual and Mergent Bond Record Monthly Update.

(3) From page 2 of Schedule PMA-3 Rebuttal.

(4) Average forecast based upon six quarterly estimates of Aaa rated corporate bonds per the consensus of nearly 50 economists reported in Blue Chip Financial Forecasts dated October 1, 2011 (see page 3 of Schedule PMA-3 Rebuttal). The estimates are detailed below.

| | |
|---|---|
| Fourth Quarter 2011 | 4.20 % |
| First Quarter 2012 | 4.20 |
| Second Quarter 2012 | 4.30 |
| Third Quarter 2012 | 4.40 |
| Fourth Quarter 2012 | 4.50 |
| First Quarter 2013 | 4.60 |
| Average | 4.37 % |

(5) The average of the historical equity risk premium of 5.80% from Line No. 3 and the forecasted equity risk premium of 13.92% from Line No. 6 ((5.80% + 13.92%) / 2 = 9.86%.

(6) Median beta derived from page 1 of Schedule PMA-3 Rebuttal.

United Water Rhode Island, Inc.
Derivation of Mean Equity Risk Premium Based on a Study
Using Holding Period Returns of Public Utilities

| Line No. | | Over A Rated Moody's Public Utility Bonds - AUS Consultants Study (1) |
|---|---|---|
| 1. | Arithmetic Mean Holding Period Returns on the Standard & Poor's Utility Index 1926-2010 (2): | 10.69 % |
| 2. | Arithmetic Mean Yield on Moody's A Rated Public Utility Yields 1926-2010 | (6.57) |
| 3. | Equity Risk Premium | 4.12 % |

Notes: (1) S&P Public Utility Index and Moody's Public Utility Bond Average Annual Yields 1928-2010, (AUS Consultants - Utility Services, 2011).

(2) Holding period returns are calculated based upon income received (dividends and interest) plus the relative change in the market value of a security over a one-year holding period.

United Water Rhode Island, Inc.
Comparable Earnings Analysis
for the Proxy Group of Non-Utility Companies Comparable to the
Proxy Group of Nine Water Companies(1)

| Company Name | VL Adjusted Beta | Unadjusted Beta | Residual Standard Error of the Regression | Standard Deviation of Beta | Rate of Return on Book Common Equity, Net Worth, or Partner's Capital 5-Year Projected (2) 5 Year Projection | | Student's T Statistic |
|---|---|---|---|---|---|---|---|
| Gallagher (Arthur J.) | 0.70 | 0.53 | 3.0037 | 0.0616 | 13.50 | % | (0.3) |
| Amgen | 0.65 | 0.43 | 3.5251 | 0.0723 | 16.00 | | (0.0) |
| AutoZone Inc. | 0.70 | 0.53 | 3.3180 | 0.0681 | NMF | | NA |
| Baxter Intl Inc. | 0.65 | 0.46 | 2.9109 | 0.0597 | 34.00 | (3) | 2.2 |
| Bristol-Myers Squibb | 0.75 | 0.58 | 2.8963 | 0.0594 | 23.00 | | 0.8 |
| Brown & Brown | 0.70 | 0.47 | 3.0782 | 0.0631 | 12.00 | | (0.5) |
| CACI Intl | 0.80 | 0.67 | 3.5529 | 0.0729 | 11.50 | | (0.6) |
| ConAgra Foods | 0.65 | 0.42 | 2.7584 | 0.0566 | 16.00 | | (0.0) |
| Cardinal Health | 0.80 | 0.67 | 3.4062 | 0.0690 | 16.50 | | 0.0 |
| Cephalon Inc. | 0.70 | 0.49 | 3.5640 | 0.0731 | 12.50 | | (0.5) |
| Capitol Fed. Finl | 0.65 | 0.43 | 3.3021 | 0.0677 | 3.50 | | (1.6) |
| Cullen/Frost Bankers | 0.85 | 0.72 | 2.8384 | 0.0582 | 10.00 | | (0.8) |
| Costco Wholesale | 0.75 | 0.58 | 2.7602 | 0.0566 | 14.00 | | (0.3) |
| CenturyLink Inc. | 0.75 | 0.55 | 2.9979 | 0.0615 | 8.00 | | (1.0) |
| CVS Caremark Corp. | 0.80 | 0.66 | 2.9829 | 0.0612 | 11.00 | | (0.7) |
| Quest Diagnostics | 0.70 | 0.50 | 2.9759 | 0.0610 | 14.50 | | (0.2) |
| DaVita Inc. | 0.60 | 0.39 | 2.8529 | 0.0585 | 16.50 | | 0.0 |
| EarthLink, Inc. | 0.65 | 0.45 | 3.4852 | 0.0715 | 12.00 | | (0.5) |
| Energy Transfer | 0.80 | 0.67 | 3.0708 | 0.0630 | 18.50 | | 0.3 |
| Edwards Lifesciences | 0.65 | 0.42 | 3.3383 | 0.0685 | 19.50 | | 0.4 |
| First Niagara Finl Group | 0.85 | 0.71 | 3.5746 | 0.0733 | 8.50 | | (1.0) |
| Forest Labs. | 0.80 | 0.63 | 3.2403 | 0.0665 | 9.50 | | (0.8) |
| Gilead Sciences | 0.65 | 0.46 | 3.4798 | 0.0714 | 39.00 | (3) | 2.8 |
| Gen-Probe | 0.80 | 0.65 | 3.3900 | 0.0695 | 12.50 | | (0.5) |
| Haemonetics Corp. | 0.60 | 0.39 | 2.9040 | 0.0596 | 12.00 | | (0.5) |
| Hasbro, Inc. | 0.75 | 0.61 | 3.4948 | 0.0717 | 28.00 | | 1.5 |
| Hudson City Bancorp | 0.80 | 0.67 | 3.2419 | 0.0665 | 9.50 | | (0.8) |
| HCC Insurance Hldgs. | 0.80 | 0.69 | 2.8073 | 0.0576 | 11.00 | | (0.7) |
| Hospira Inc. | 0.70 | 0.52 | 3.1915 | 0.0655 | 20.00 | | 0.5 |
| Hershey Co. | 0.65 | 0.43 | 2.8155 | 0.0577 | 35.00 | (3) | 2.3 |
| Heartland Express | 0.80 | 0.65 | 3.5643 | 0.0731 | 22.50 | | 0.8 |
| IAC/InterActiveCorp | 0.70 | 0.48 | 3.2717 | 0.0740 | 6.50 | | (1.2) |
| Investors Bancorp | 0.75 | 0.55 | 3.4123 | 0.0700 | 9.50 | | (0.8) |
| J&J Snack Foods | 0.70 | 0.49 | 3.4392 | 0.0705 | 13.00 | | (0.4) |
| Kroger Co. | 0.60 | 0.38 | 3.0840 | 0.0633 | 20.50 | | 0.5 |
| Lancaster Colony | 0.75 | 0.57 | 3.3777 | 0.0693 | 18.00 | | 0.2 |
| Life Technologies | 0.85 | 0.72 | 3.4327 | 0.0704 | 16.00 | | (0.0) |
| McKesson Corp. | 0.75 | 0.57 | 3.3031 | 0.0678 | 16.00 | | (0.0) |
| Mercury General | 0.70 | 0.52 | 2.9569 | 0.0606 | 12.00 | | (0.5) |
| Medtronic, Inc. | 0.85 | 0.70 | 3.3449 | 0.0686 | 16.00 | | (0.0) |
| Marsh & McLennan | 0.75 | 0.60 | 2.9522 | 0.0606 | 19.00 | | 0.4 |
| MAXIMUS Inc. | 0.80 | 0.63 | 3.1773 | 0.0652 | 28.50 | | 1.5 |
| Microsoft Corp. | 0.85 | 0.70 | 2.8942 | 0.0594 | 34.00 | (3) | 2.2 |
| Annaly Capital Mgmt. | 0.70 | 0.48 | 3.5671 | 0.0732 | 12.00 | | (0.5) |
| Northrop Grumman | 0.85 | 0.72 | 2.9442 | 0.0604 | 13.50 | | (0.3) |
| Northwest Bancshares | 0.75 | 0.61 | 3.2643 | 0.0670 | 7.50 | | (1.1) |
| Owens & Minor | 0.65 | 0.46 | 3.3954 | 0.0696 | 14.00 | | (0.3) |
| OReilly Automotive | 0.80 | 0.63 | 3.4308 | 0.0704 | 11.50 | | (0.6) |
| Peoples United Finl | 0.65 | 0.40 | 3.0327 | 0.0622 | 6.50 | | (1.2) |
| Philip Morris Intl | 0.75 | 0.57 | 2.8183 | 0.0621 | NMF | (3) | NA |
| Reynolds American | 0.60 | 0.33 | 2.8936 | 0.0594 | 23.00 | | 0.8 |
| Ruddick Corp. | 0.65 | 0.41 | 3.5050 | 0.0719 | 11.50 | | (0.6) |
| RLI Corp. | 0.80 | 0.64 | 2.8371 | 0.0582 | 9.00 | | (0.9) |
| Rollins, Inc. | 0.80 | 0.68 | 3.0392 | 0.0623 | 32.00 | | 2.0 |
| Sherwin-Williams | 0.70 | 0.49 | 3.0580 | 0.0627 | 24.00 | | 1.0 |
| Smucker (J.M.) | 0.70 | 0.48 | 2.9641 | 0.0608 | 11.00 | | (0.7) |

United Water Rhode Island, Inc.
Comparable Earnings Analysis
for the Proxy Group of Non-Utility Companies Comparable to the
Proxy Group of Nine Water Companies(1)

| Company Name | VL Adjusted Beta | Unadjusted Beta | Residual Standard Error of the Regression | Standard Deviation of Beta | Rate of Return on Book Common Equity, Net Worth, or Partner's Capital 5-Year Projected (2) 5 Year Projection | Student's T Statistic |
|---|---|---|---|---|---|---|
| Sara Lee Corp. | 0.80 | 0.65 | 3.2417 | 0.0665 | NMF (3) | NA |
| Silgan Holdings | 0.80 | 0.62 | 3.1409 | 0.0644 | 16.50 % | 0.0 |
| Synopsys, Inc. | 0.85 | 0.72 | 2.8110 | 0.0577 | 11.00 | (0.7) |
| Suburban Propane | 0.75 | 0.61 | 2.9525 | 0.0606 | 26.00 | 1.2 |
| Stericycle Inc. | 0.70 | 0.50 | 3.2018 | 0.0657 | 15.50 | (0.1) |
| Safeway Inc. | 0.70 | 0.49 | 3.3748 | 0.0692 | 17.00 | 0.1 |
| Stryker Corp. | 0.80 | 0.67 | 3.1602 | 0.0648 | 16.50 | 0.0 |
| Molson Coors Brewing | 0.60 | 0.38 | 3.4479 | 0.0707 | 8.00 | (1.0) |
| Teleflex Inc. | 0.80 | 0.68 | 3.1890 | 0.0654 | 9.50 | (0.8) |
| Hanover Insurance | 0.80 | 0.69 | 2.7584 | 0.0566 | 10.00 | (0.8) |
| TJX Companies | 0.80 | 0.66 | 2.9572 | 0.0607 | 44.00 (3) | 3.4 |
| Varian Medical Sys. | 0.80 | 0.68 | 3.5670 | 0.0732 | 25.00 | 1.1 |
| Walgreen Co. | 0.75 | 0.62 | 3.2391 | 0.0664 | 20.50 | 0.5 |
| WD-40 Co. | 0.75 | 0.55 | 3.5630 | 0.0731 | 16.50 | 0.0 |
| Weis Markets | 0.65 | 0.45 | 2.9580 | 0.0607 | 9.00 | (0.9) |
| Watson Pharmac. | 0.75 | 0.58 | 2.9974 | 0.0615 | 14.00 | (0.3) |
| Berkley (W.R.) | 0.70 | 0.49 | 2.9596 | 0.0607 | 13.50 | (0.3) |
| West Pharmac. Svcs. | 0.80 | 0.66 | 3.2917 | 0.0675 | 14.00 | (0.3) |
| World Wrestling Ent. | 0.80 | 0.66 | 3.5148 | 0.0721 | 16.50 | 0.0 |
| Alleghany Corp. | 0.80 | 0.65 | 3.2027 | 0.0657 | 6.00 | (1.3) |
| Average | 0.74 | 0.56 | 3.1743 | 0.0653 | | |
| Average for the Proxy Group of Nine Water Companies | 0.72 | 0.52 | 3.1680 (1) | 0.0656 | | |
| Median (4) | | | | | 14.00% | |
| Conservative Median (5) | | | | | 13.75% | |

Notes:
(1) See page 5 of Schedule PMA-9 Rebuttal.
(2) From Value Line Investment Survey, various issues for the years 2014 - 2016.
(3) The student's T statistic associated with these returns exceeds 1.96 at the 95% level of confidence. Therefore, they have been excluded, as outliers, to arrive at proper projected returns as fully explained in Ms. Ahern's testimony.
(4) Median five year projected rate of return on book common equity, shareholders' equity, net worth, or partners' capital including returns identified as outliers as outlined in note (3) above.
(5) Median five year projected rate of return on book common equity, shareholders' equity, net worth, or partners' capital excluding returns identified as outliers as outlined in note (3) above.