Exhibit No.:	
Issues:	Return on Equity Capital Structure
Witness:	Pauline M. Ahern
Exhibit Type:	Rebuttal
Sponsoring Party:	Missouri-American Water Company
Case No.:	WR-2011-0337
Date:	January 19, 2012

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2011-0337

REBUTTAL TESTIMONY

OF

PAULINE M. AHERN, CRRA

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

IN THE MATTER OF MISSOURI-AMERICAN WATER COMPANY FOR AUTHORITY TO FILE TARIFFS REFLECTING INCREASED RATES FOR WATER AND SEWER SERVICE	)))))	**CASE NO. WR-2011-0337** **CASE NO. SR-2011-0338**

AFFIDAVIT OF PAULINE M. AHERN

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

Pauline M. Ahern [signature]

Pauline M. Ahern

State of New Jersey
County of Burlington
SUBSCRIBED and sworn to
Before me this 17th **day of** January **2012.**

Sharon M. Keefe [signature]

Notary Public

My commission expires:

SHARON M. KEEFE
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES JULY 9, 2016

TABLE OF CONTENTS

Page No.

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 schedules which support your rebuttal testimony?

A. Yes, I have. They have been marked for identification as Schedules PMA-18 through PMA- 39.

PURPOSE

Q. What is the purpose of this testimony?

A. The purpose of this testimony is to rebut certain aspects of the Missouri Public Service Commission Staff Report – Cost of Service (Staff Report, Staff Witness Matthew J. Barnes), as well as the direct testimonies of Mr. Michael P. Gorman, Witness for the Missouri Industrial Energy Consumers (MIEC) and Ms. Billie Sue LaConte, Witness for BJC Healthcare (BJC). Specifically, I will address Staff's comments relative to the concept of double leverage; its application of the Discounted Cash Flow (DCF) Model and Capital Asset Pricing Model (CAPM); and, its failure to reflect Missouri American Water Company's (MAWC) greater unique business risks relative to its proxy group of six water companies, the greater financial risk of Staff's recommended capital structure ratios as well as flotation costs. Relative to the direct testimony of Mr.

Gorman, I will address his applications of the DCF, Risk Premium Model (RPM) and CAPM. Relative to the direct testimony of Ms. LaConte, I will address her applications of the DCF and CAPM. In addition, I will address Mr. Gorman's and Ms. LaConte's their failure to reflect MAWC's greater unique business risks relative to their proxy groups of water companies and flotation costs.

SUMMARY

Q. Please briefly summarize your rebuttal testimony.

A. My rebuttal testimony addresses Staff's discussion of the concept of double leverage and how it violates the basic financial principles of risk and return, the opportunity cost of capital, is discriminatory and based upon faulty assumptions.

My rebuttal testimony also describes a number of errors causing Staff's recommended common equity cost rate to be well below any reasonable range for MAWC because:

- Staff erroneously relies primarily upon the DCF model to arrive at its recommended common equity cost rate despite the Commission's consideration of the results of other cost of common equity models. Staff uses, albeit incorrectly, the CAPM model but only as a check on its flawed and understated recommendation. The Efficient Market Hypothesis (EMH), upon which all the cost of common equity models are premised, confirms that investors rely upon multiple cost of common equity models in formulating their required rates of return.
- Staff's test of reasonableness, i.e., its CAPM analysis, is flawed.

- Staff's recommended range of common equity cost rate is not consistent with the expected returns on book common equity for Staff's proxy group of water companies.
- Staff failed to reflect MAWC's unique business risks, the greater financial risk inherent in Staff's recommended American Water Works Company's (American Water or the Parent) consolidated capital structure and debt cost rate, as well as flotation costs.

My rebuttal testimony also describes a number of errors causing bot MIEC's and BJC's recommended common equity cost rate to be well below any reasonable cost rate for MAWC because:

- MIEC's applications of the DCF, RPM and CAPM and BJC's application of the DCF and CAPM are flawed; and
- Both MIEC and BJC failed to reflect MAWC's unique business risks, the lower financial risk inherent in MAWC's capital structure as well as flotation costs.

Finally, my rebuttal testimony provides an updated capital structure, senior capital cost rates and recommended common equity cost rate based upon current capital market conditions.

CAPITAL STRUCTURE

Double Leverage

Q. On page 18 at lines 1-13 of the Staff Report, Staff provides the fourth reason for its use of American Water's consolidated capital structure, namely American Water's use of double leverage. Please comment.

A. Company Witness William D. Rogers rebuttal testimony discusses why it is not possible for American Water to use double leverage since the Parent debt was incurred to finance the retirement of RWE's preferred stock and other payments to RWE resulting in no cash proceeds being available to infuse equity into MAWC or any other American Water subsidiary. Consequently, the notion that American Water employs double leverage, i.e., a mix of debt and equity, to fund its equity infusions to MAWC or any of its operating subsidiaries, as a rationale for using American Water's consolidated capital structure for ratemaking purposes to determine MAWC's allowed overall rate of return is unfounded. In addition, the very concept of double leverage and subsequent use of the parent consolidated capital structure is flawed for five reasons:

1. It violates the basic financial principle of risk and return;
2. It is inconsistent with the concept of the opportunity cost of capital;
3. It discriminates against the investor, i.e., the parent, in the regulated operating utility, thus violating both the concept of fairness and the capital attraction standard;
4. It is based upon some highly problematic assumptions; and,
5. As Roger A. Morin states[1]: "[t]he double leverage approach is a tautology."

Q. Please explain how double leverage violates the basic financial principle of risk and return.

A. The basic financial principle of risk and return states that the rate of return

[1] Morin, Roger A., New Regulatory Finance, 526 (Public Utilities Reports 2006).

required by investors on any investment is dependent upon the risk of that investment and that investment alone. Since most investors are risk averse, this means that the higher the investor perceived risk of an investment, the higher the return required by investors. As Eugene F. Brigham states[2] :

> *In a market dominated by risk-averse investors, riskier securities will have higher expected returns, as estimated by the average investor, than will less risky securities, for if this situation does not hold, actions will occur in the market to force it to occur.* (italics in original)

The risk of any investment, including investment in MAWC, is independent of the ownership of the capital financing the investment. In addition, 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[3]:

> *The true cost of capital depends on the use to which the capital is put.* (italics in original)
>
> * * * *
>
> The company cost of capital is the correct discount rate for projects that have the same risk as the company's existing business. . . . In principle, 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.

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

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2 Brigham, Eugene F., Fundamentals of Financial Management, 114 (The Dryden Press, 5th Ed. 1989).

3 Brealey, Richard A. and Myers, Stewart C., Principles of Corporate Finance 205,299 (McGraw-Hill Book Company, 1988).

is exposed including the financial risk inherent in that utility's capital structure. It would be illogical to state that the required return on investment is zero 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 your cost basis, as an inheritor, on the market value of inherited common stock on the date of death of the person who willed the stock and not on its zero cost to you.

Just as illogical is the inevitable conclusion that, in the event that the common shares of the operating water utility subsidiary were held by both a corporate parent and by an outside investor or investors, that portion of subsidiary equity supplied by the parent would have one cost rate, i.e., the parent's weighted overall cost of capital, while the portion supplied by the outside investor or investors would have another, i.e., their investor required return based upon the risk to which their capital is put.

In view of the foregoing, using the concept of double leverage to justify the use of American Water's consolidated capital structure and not MAWC's ratemaking capital structure violates the basic financial principle of risk and return, because it presumes that MAWC's investment risk is equal to that of American Water.

Q. Please explain how double leverage is inconsistent with the concept of the opportunity cost of capital.

A. The opportunity cost of capital is that rate of return offered by investments of comparable risk. It is called the opportunity cost because it represents the return which is given up or foregone by investing in one investment alternative as opposed to an alternative investment of comparable risk. If the risk-adjusted cost of equity investment in an operating water utility subsidiary, such as MAWC, is 9.90% (the midpoint of Staff's recommended range common equity cost rate) and the effective authorized return is less than 9.90% through the use of a consolidated capital structure, i.e., assuming double leverage, then there is no incentive for a parent company, such as American Water, to invest in that operating subsidiary. In order to do so, the parent would have to forego the risk-adjusted return of 9.90% on alternative investments not subject to double leverage, in the form of a consolidated parent capital structure.

In fact, Staff's recommended 9.90% common equity cost rate results in an effective authorized return on common equity ROE for MAWC of only 8.93% based upon an income tax rate of 35% and as derived in Schedule PMA-18

In fact, the use of double leverage through use of a consolidated parent capital structure presents an incentive to spin-off the subsidiary, because the utility subsidiary should then be allowed a return on equity commensurate with its own business and financial risks and not one derived from the parent company's consolidated capital structure, which presumably would be lower. If such a divestiture were to occur, any cost reducing benefits due to economies of scale and diversification would be lost to the utility's ratepayers.

Hence, double leverage in the form of the use of a consolidated parent capital structure is inconsistent with the concept of the opportunity cost of capital.

Q. How does the use of a consolidated parent capital structure discriminate against the parent holding company as the investor, thus violating the concept of fairness and the capital attraction standard?

A. The holding company's required return on its equity investment in the operating utility subsidiary is the risk-adjusted cost of common equity of that utility which is dependent upon that utility's specific business and financial risks as stated previously. Double leverage, in the form of imposing the parent's consolidated capital structure, requires the use of the parent holding company's overall cost of capital as the operating utility subsidiary's overall cost of capital. In so doing, the parent holding company investor is denied the opportunity to earn its required rate of return based upon the risk to which its common equity investment in that utility is exposed. In this proceeding, should Staff's recommended overall rate of return be adopted, based upon an income tax rate of 35%, MAWC would, in effect, be authorized an 8.93% return on equity capital as discussed above. This would not be the case for a utility whose stock is held not by a holding company, but by individual investors.

For example, if there are two operating utilities with identical business and financial risks, the cost of common equity for both would be identical according to the basic financial principle of risk and return as discussed previously. However, if one of the utilities is an operating subsidiary of a parent holding company and its allowed overall rate of return is based upon the parent company's consolidated capital structure, the parent holding company will not be fairly compensated for the risk it bears by investing in the subsidiary. This is discriminatory. As Roger A. Morin states[4]:

> Estimating equity costs by one procedure for publicly held utilities and by another for utilities owned by a holding company is inconsistent with financial theory and discriminates against the holding company form of ownership. Two utilities identical in all respects but their ownership format should have the same set of rates. Yet, this would not be the case under the double leverage adjustment.

In addition, double leverage in the form of imposing a parent consolidated capital structure containing less common equity than the regulated subsidiary will weaken the regulated utility's ability to attract capital in violation of the capital attraction standard established in Bluefield[5] which states that:

> A public utility is entitled to such rates as will permit it to earn a 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. . . . The return should be reasonable sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.

The regulated utility must compete in the capital markets for its debt capital and must earn a reasonable return on its common equity to assure potential bond holders of its creditworthiness. The use of double leverage, in the form of imposing a parent consolidated capital structure, does not permit an opportunity to earn a rate of return commensurate with publicly owned enterprises of similar risk, thereby pressuring cash flows and potentially

[4] Morin, 525.

[5] Bluefield Water Works Improvement Co. v. Public Serv. Comm'n, 262 U.S. 679 (1922).

impairing interest coverage and, in turn, the regulated utility's ability to attract debt capital at reasonable costs.

Thus, the use of double leverage, in the form of imposing a parent consolidated capital structure, is both discriminatory and patently unfair to the parent holding company. Some of the assumptions of double leverage are highly problematic and nonsensical.

Q. What are some of the problematic assumptions upon which the concept of double leverage is based?

A. First, double leverage, in the form of imposing a parent consolidated capital structure, assumes that all of the regulated subsidiary's equity capital was provided by the parent holding company. However, the retained earnings of the subsidiary are not derived from the parent. Rather, retained earnings result from the accumulated net income to common equity after payment of common dividends and are derived from revenues collected from the regulated operating subsidiary's ratepayers. Also, any debt or preferred stock issued to holders other than the parent company, are not derived from the parent. In addition, if the proceeds of any of the senior capital, i.e., debt and / or preferred equity, at the parent level were used to specifically invest in the operations of other subsidiaries or to acquire another subsidiary, the assumption that such funds were available for investment in the subsidiary subject to the imposition of the parent consolidated capital structure is invalid.

Second, double leverage assumes that the business and financial risks of all the operating subsidiaries are identical and, in turn, identical to the business and financial risks of the parent holding company. This is clearly non-sensical, given that, at the very least, other regulated operating utility subsidiaries most likely operate in different states under different regulatory paradigms, as is the case with AWW, which has regulated operations in twenty (20) states. In addition, the regulated operating subsidiaries of AWW are of different sizes, and face different operating and financial risks. Clearly, the risks of all American Water's regulated operating subsidiaries are not equal. Once again, the risk and return principle is violated by double leverage, including the imposition of a parent consolidated capital structure, because it assumes the same overall cost of capital for all the subsidiaries regardless of their specific risk differences.

Q. Please explain how "[t]he double leverage approach is a tautology."

A. A tautology is unnecessary redundancy, i.e., saying the same thing twice. The double leverage approach using a parent consolidated capital structure is a tautology because it is not the parent's overall cost of capital that determines the subsidiary's overall cost of capital because the parent's overall cost of capital is itself a weighted average of capital costs of all subsidiaries.[6] A holding company is like a mutual fund, but one which holds its operating subsidiaries in its portfolio of assets instead of capital market securities, i.e., stocks and bonds. A mutual fund's required return, based upon portfolio theory, is the weighted average of the returns of the individual securities in the fund. Each security in the fund has its own unique required return which is a

[6] Morin, 526.

function of its individual risk profile. The concept of double leverage, including the use of a parent consolidated capital structure, if applied to a mutual fund, indicates that the required return on any given individual security held by the mutual fund is the weighted average required return on the mutual fund as a whole. This defies common sense. If an investor could expect to receive the same return on the individual securities as in the mutual fund as a whole why, would he / she invest in the fund and pay the attendant fees which would then reduce his / her return?

Thus, the use of double leverage and use of a parent consolidated capital structure transposes the direction of cause and effect on the parent's overall cost of capital. Consistent with the fundamental and basic financial concept of risk and return, discussed above, the overall cost of capital of a regulated operating utility subsidiary is a function of its business and financial risks and must be found on a stand-alone basis, which requires the use of the Company's own capital structure and cost rates, including the cost rate of common equity capital, and not the use of the parent consolidated capital structure, which assumes the weighted average overall cost of capital of the consolidated parent company is that of the subsidiary.

COMMON EQUITY COST RATE

Testimony of MoPSC Staff Witness Matthew J. Barnes

Discounted Cash Flow Model

Q. Staff's range of recommended common equity cost rate, 9.40% - 10.40%, with a midpoint of 9.90% is based exclusively upon a Discounted Cash Flow (DCF) analysis, notwithstanding its use of the CAPM as a check. Please comment.

A. No single common equity cost rate model should be relied upon exclusively in determining a cost rate of common equity and the results of multiple cost of common equity models should be taken into account. Staff's exclusive reliance upon the DCF model, notwithstanding its use of the CAPM as a check, is at odds with the EMH, upon which the DCF is predicated.

The DCF model utilized by Staff is market-based since market prices are employed in its application. Therefore, it is based upon the EMH which is the foundation of modern investment theory, first pioneered by Eugene F. Fama[7] in 1970. As discussed in my direct testimony, pages 32 through 34, 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 economic value of a security.[8]

The semistrong form of the EMH, which asserts that all publicly available information is fully reflected in securities prices, i.e., fundamental analysis cannot "outperform the market", is generally held to be true because the use of insider information often enables investors to "outperform the market" and earn excessive returns. This means that all perceived risks are taken into account by investors in the prices they pay for securities. Investors are thus aware of all publicly-available information, including bond ratings; discussions about companies by bond rating agencies and investment analysts; as well as the

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

[8] Brigham (1989) 225.

various cost of common equity methodologies (models) discussed in the financial literature.

Q. Do you have further academic support for the need to rely upon more than one cost of common equity model in arriving at a recommended common equity cost rate?

A. Yes. For example, Phillips[9] states:

> Since regulation establishes a level of authorized earnings which, in turn, implicitly influences dividends per share, estimation of the growth rate from such data is an inherently circular process. For these reasons, the DCF model "suggests a degree of precision which is in fact not present" and leaves "wide room for controversy and argument about the level of k". (italics added) (p. 396)
>
> * * *
>
> Despite the difficulty of measuring relative risk, the comparable earnings standard is no harder to apply than is the market-determined standard. The DCF method, to illustrate, requires a subjective determination of the growth rate the market is contemplating. Moreover, as Leventhal has argued: 'Unless the utility is permitted to earn a return comparable to that available elsewhere on similar risk, it will not be able in the long run to attract capital.' (italics added) (p. 398)

Also, Morin[10] states:

> Each methodology requires the exercise of considerable judgment on the reasonableness of the assumptions underlying the methodology and on the reasonableness of the proxies used to validate a theory. *The inability of the DCF model to account for changes in relative market valuation, discussed below, is a vivid example of the potential shortcomings of the DCF model when applied to a given company.* Similarly, the inability of the CAPM to account for variables that affect security returns other than beta tarnishes its use. (italics added)

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9 Phillips, Jr., Charles F. The Regulation of Public Utilities-Theory and Practice (Public Utility Reports, Inc., 1993) 396, 398.

10 Morin 428-431.

> 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)
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> * * *
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> The financial literature supports the use of multiple methods. Professor Eugene Brigham, a widely respected scholar and finance academician, asserts:[1(footnote omitted)]
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>> 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.
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> Another prominent finance scholar, Professor Stewart Myers, in an early pioneering article on regulatory finance, stated:[2(footnote omitted)]
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>> 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 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 view of the foregoing, it is clear that investors are aware of all of the models available for use in determining common equity cost rate. The EMH requires the assumption that, collectively, investors use them all.

Q. Please comment upon Staff's estimation of the growth component for its DCF analysis.

A. On page 20, lines 10 - 20 of the Staff Report, Staff discusses its use of historical growth in dividends per share (DPS), earnings per share (EPS), book value per share (BVPS) as well as projected growth in DPS, EPS, and BVPS. More appropriately, Staff should have relied exclusively upon security analysts' forecasts of EPS growth. Security analysts' forecasts take into account historical information as well as all current information likely to impact the future, which is critical since both cost of capital and ratemaking are prospective. In addition, Myron Gordon, who first introduced the DCF model adapted for utility ratemaking, came to recognize long after his book, The Cost of Capital to a Public Utility was published in 1974, that the growth component of his original "Gordon Model" which relied upon the sustainable growth method had a serious limitation. Dr. Gordon, in a presentation on March 27, 1990 (some 16 years after the publication of his 1974 book), before the Institute for

Quantitative Research In Finance, in Palm Beach, Florida, entitled, The Pricing of Common Stocks, stated that analysts' growth rate projections were superior to the sustainable growth method:

> The most serious limitation of the Gordon Model is the assumption that the dividend expectation can be represented with just two parameters, D and br … We have seen that earnings and growth estimates by security analysts were found by Malkiel and Cragg to be superior to data obtained from financial statements for the explanation of variation in price among common stocks. That is, better estimates are obtained for the coefficient of the various explanatory variables. …*estimates by security analysts available from sources such as IBES are far superior to the data available to Malkiel and Cragg. Secondly, the estimates by security analysts must be superior to the estimates derived solely from financial statements*. (italics added)

Also, Morin notes[11]:

> Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g. The accuracy of these forecasts in the sense of whether they turn out to be correct is not at issue here, as long as they reflect widely held expectations. As long as the forecasts are typical and/or influential in that they are consistent with current stock price levels, they are relevant. The use of analysts' forecasts in the DCF model is sometimes denounced on the grounds that it is difficult to forecast earnings and dividends for only one year, let alone for longer time periods. This objection is unfounded, however, because it is present investor expectations that are being priced; it is the consensus forecast that is embedded in price and therefore in required return, and not the future as it will turn out to be.
>
> . . . .
>
> Published studies in the academic literature demonstrate that growth forecasts made by security analysts represent an appropriate source of DCF growth rates, are reasonable indicators

[11] Morin, 298.

> of investor expectations and are more accurate than forecasts based on historical growth. These studies show that investors rely on analysts' forecasts to a greater extent than on historic data only.

Cited on page 37 of my direct testimony, are studies performed by Cragg and Malkiel[12] which demonstrate that analysts' forecasts are superior to historical growth rate extrapolations. As noted on page 38, while some question the accuracy of analysts' forecasts of EPS growth, it does not really matter what the level of accuracy of those analysts' forecasts is well after the fact. What is important is that they influence investors and hence the market prices they pay.

Relative to continuing conflicts of interest and subsequent bias in security analysts' forecasts of EPS growth following the 2002 financial market reforms, my direct testimony at page 39, lines 5 - 16 notes that Burton A. Malkiel[13] affirmed his belief in the superiority of analysts' earnings forecasts when he testified before the Public Service Commission of South Carolina, in November 2002 (see Schedule PMA-19)[14]:

There was much publicity given to tainted analysts' forecasts leading up to the late 1990's. In the wake of investigations instituted by the New York Attorney General, the National Association of Securities Dealers, and the

[12] Cragg, John G. and Malkiel, Burton G. Expectations and the Structure of Share Prices (University of Chicago Press, 1982) Chapter 2 (Ahern Workpaper 13).

[13] Malkiel, Burton A., the Chemical Bank Chairman's Professor of Economics at Princeton University and author of the widely-read national bestselling book on investing entitled, "A Random Walk Down Wall Street: The Time-Tested Strategy for Successful Investing (Completely Revised and Updated)" (W.W. Norton & Co. 2011).

[14] Re: South Carolina Electric & Gas Co., Docket No. 2002-223-E "Rebuttal Testimony", pp. 16-17 (S.C.P.S.C. Nov. 2002).

Securities & Exchange Commission, I believe the upward bias that existed in the late 1990s has diminished. In summary, I believe that current analysts' forecasts are more reliable than they were during the late 1990s. Therefore, analysts' forecasts remain the proper tool to use in performing a Gordon Model DCF analysis.

Moreover, there is no empirical evidence that investors, consistent with the EMH, would discount or disregard analysts' estimates of growth in earnings per share. "Do Analyst Conflicts Matter? Evidence From Stock Recommendations,"[15] provided in Schedule PMA-20, examined whether conflicts of interest with investment banking ["IB"] and brokerage businesses induced sell-side analysts to issue optimistic stock recommendations and whether investors were misled by such biases. They conclude on page 1 of Schedule PMA-20.

> Overall, our findings do not support the view that conflicted analysts are able to systematically mislead investors with optimistic stock recommendations.

On page 29 of Schedule PMA-20, Agrawal and Anup state:

> Overall, our empirical findings suggest that while analysts do respond to IB and brokerage conflicts by inflating their stock recommendations, the market discounts these recommendations after taking analysts' conflicts into account. These findings are reminiscent of the story of the nail soup told by Brealey and Myers (1991), except that here analysts (rather than accountants) are the ones who put the nail in the soup and investors (rather than analysts) are the ones to take it out. Our finding that the market is

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15 Agrawal, Anup and Chen, Mark A., "Do Analysts' Conflicts Matter? Evidence from Stock Recommendations", (Journal of Law and Economics, August 2008), Vol. 51.

> not fooled by biases stemming from conflicts of interest echoes similar findings in the literature on conflicts of interest in universal banking (for example, Kroszner and Rajan, 1994, 1997; Gompers and Lerner 1999) and on bias in the financial media (for examples, Bhattacharya et al. forthcoming; Reuter and Zitzewitz 2006). Finally, while we cannot rule out the possibility that some investors may have been naïve, our findings do not support the notion that the marginal investor was systematically misled over the last decade by analysts' recommendations.

As discussed above and in my direct testimony, the market is efficient. Therefore, investors are aware of all publicly-available information, including the many available security analysts' earnings growth forecasts. Investors are thus 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 available forecasts at the time of their investment decision making, as that accuracy only becomes known after some future period of time has elapsed.

Hence, consistent with the EMH upon which the cost of common equity models utilized by both Staff and myself are predicated, since investors have such security analysts' earnings growth rate projections available to them and investors are aware of the accuracy of such projections, security analysts' earnings projections should be used in a cost of common equity analysis. Staff would have us ignore this reality by disregarding the largest influence on individual investors who own approximately 53% on average (see Schedule PMA-9) of all the common shares of the companies in my proxy group of nine water proxy companies. Rate of return analysts, such as Mr. Barnes (Staff) and myself, who attempt to emulate investor behavior, should not ignore this reality.

Q. What would Staff's DCF results have been if Staff had properly relied upon security analysts' projected growth in EPS in its DCF analysis?

A As shown on Schedule PMA-21, had Staff relied upon security analysts' projected growth in EPS, an average DCF cost rate of 10.53% results. The average projected EPS growth rate ranges from 6.00% - 9.75% and when added to Staff's dividend yield of 3.37%, results in a range of DCF cost rate of 9.37% - 13.12%, with a midpoint of 11.25%. DCF cost rates of 10.53% and 11.25% clearly demonstrate that Staff's DCF results, ranging from 8.97% - 9.97% and Staff's recommended range of common equity cost rate of 9.40% - 10.40% are grossly understated. Moreover, these cost rates are further understated because they do not reflect either MAWC's greater unique business risks relative to Staff's proxy group of six water companies, the greater financial risk of Staff's recommended capital structure ratios or flotation costs.

Capital Asset Pricing Model

Q. Do you have any comment regarding Staff's application of the CAPM?

A. Yes. Staff's application of the CAPM is flawed in four respects; 1) its choice of the historical yield on 30-year U.S. Treasury bond as the risk-free rate; 2) its use of historical market equity risk premiums which were incorrectly derived; 3) its failure to also include a forecasted market equity risk premium; and, 4) its failure to also apply the ECAPM to account for the fact that the Security Market Line (SML) as described by the traditional CAPM is not as steeply sloped as the predicted SML.

Q. Please comment upon Staff's use of the historical yield on 30-year U.S. Treasury bonds as the risk-free rate.

A. Both the determination of cost of capital and the determination of rates for utility services are prospective in nature. Therefore, it is inappropriate to use an historical yield as the risk-free rate in a CAPM analysis. Rather, a prospective yield on 30-year U.S. Treasury bonds should be used such as the projections Staff provides on Schedule 5 of the Staff Report. On Schedule 5, Staff shows that the Value Line Investment Survey – Selection & Opinion (Value Line – S&O) projects long-term U.S. Treasury bond yields of 4.90% for 2012 and 5.00% for 2013 which average 4.95%. Thus, Staff's recommended 3.04% average yield on 30-year U.S. Treasury bonds for September 2011 significantly understates the prospective yield.

Q. You have stated that Staff erred in exclusively relying upon historical market equity risk premiums which were incorrectly derived. Please explain.

A. Staff's derivation of historical market equity premiums is incorrect for two reasons. First, Staff's arithmetic historical market equity risk premium is incorrectly calculated. Second, Staff also relied upon the geometric historical market equity risk premium.

Q. Why is Staff's arithmetic historical market equity risk premium incorrectly calculated?

A. Staff's arithmetic historical market equity risk premium of 6.0% is derived from the Ibbotson® SBBI® – 2011 Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation – 1926-2010 (2011 SBBI) as the difference between the arithmetic mean 1926-2010 total return on large company stocks of 11.9% and the arithmetic mean 1926-2010 total return on long-term government bonds of 5.9%. (6.0% = 11.9% - 5.9%).[16] The correct derivation of the historical market equity risk premium is the difference between the total return on large company stocks of 11.9% and the arithmetic mean 1926-2010 income return on long-term government bonds of 5.2% which results in a market equity risk premium of 6.7% (6.7% = 11.9% - 5.2%). Regarding the use of the income return and not the total return for Treasury securities in deriving an equity risk premium, 2011 SBBI states (see page 5 of Schedule PMA-22)[17] :

> Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return.[2 (footnote omitted)] (emphasis added)

Hence, the correct historical market equity risk premium is 6.7% and not 6.0%.

Q. Please discuss Staff's use of a geometric mean market risk premium for 1926-2010.

[16] Ibbotson SBBI – 2011 Valuation Yearbook – Market Results for Stocks, Bonds, Bills and Inflation – 1926-2010 (Morningstar, Inc., 2011) 23.

[17] Ibbotson 2011 SBBI 55.

A. In addition to calculating a CAPM derived common equity cost rate based upon the historical arithmetic mean equity risk premium, albeit, incorrectly derived, Staff also calculated a CAPM derived common equity cost rate using the long-term historical geometric mean equity risk premium. This latter calculation is not a valid means of estimating the cost of capital based upon historical returns.

The arithmetic mean return and not the geometric mean return is appropriate for cost of capital purposes as noted in 2011 SBBI (see page 5 of Schedule PMA-22)[18]:

> The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return.
>
> The argument for using the arithmetic average is quite straightforward. In looking at projected cash flows, the equity risk premium that should be employed is the equity risk premium that is expected to actually be incurred over the future time periods. Graph 5-2 shows the realized equity risk premium for each year based on the returns of the S&P 500 and the income return on long-term government bonds. (The actual, observed difference between the return on the stock market and the riskless rate is known as the realized equity risk premium.) There is considerable volatility in the year-by-year statistics. At times the realized equity risk premium is even negative.

[18] Ibbotson 2011 SBBI 56.

As discussed in my direct testimony at page 44, line 31 through page 47, line 16 and demonstrated on Schedule PMA-11, because historical total returns and equity risk premiums differ in size and direction over time, the arithmetic mean provides insight into the variance and standard deviation of returns, i.e., risk. Thus the prospect for variance, i.e., standard deviation, captured in the arithmetic mean, provides the valuable insight needed by investors and rate of return analysts alike to estimate the expected risk of stocks. Without such insight, investors cannot meaningfully evaluate prospective risk. Because the geometric mean relates the change over many periods to a constant rate of change, the variance, i.e., year-to-year fluctuations, and hence, risk, which is critical to rate of return analysis, is not reflected in geometric mean returns / premiums.

The financial literature is quite clear on this point, that risk is measured by the variability of expected returns, i.e., the probability distribution of returns.[19] Pages 53 through 68 of 2011 SBBI (see Schedule PMA-22) explain in detail why the arithmetic mean is the correct mean to use when estimating the cost of capital.

In addition, Weston and Brigham[20] provide the standard financial textbook definition of the riskiness of an asset when they state:

> The riskiness of an asset is defined in terms of the likely variability of future returns from the asset. (emphasis added)

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19 Brigham (1989) 639.

20 Weston, J. Fred and Brigham, Eugene F., Essentials of Managerial Finance Third Edition (The Dryden Press, 1974) 272.

Morin also states[21]:

> The geometric mean answers the question of <u>what constant return</u> you would have to achieve in each year to have your investment growth match the return achieved by the stock market. The arithmetic mean answers the question of what growth rate is the best estimate of the <u>future</u> amount of money that will be produced by continually reinvesting in the stock market. It is the rate of return which, compounded over multiple periods, gives the mean of the probability distribution of ending wealth. (emphasis added)

In addition, Brealey and Myers[22] note:

> The proper uses of arithmetic and compound rates of return from past investments are often misunderstood. . . Thus the arithmetic average of the returns correctly measures the opportunity cost of capital for investments. . . *Moral*: If the cost of capital is estimated from historical returns or risk premiums, use arithmetic averages, not compound annual rates of return. (italics in original)

As previously discussed, investors gain insight into relative riskiness by analyzing expected future variability. This is accomplished by the use of the arithmetic mean of a distribution of returns / premiums. Only the arithmetic mean takes into account <u>all</u> of the returns / premiums, hence, providing meaningful insight into the variance and standard deviation of those returns / premiums.

Q. You have also stated that Staff erred in not including a forecasted market equity risk premium in its CAPM analysis. Please explain.

A. Staff relied exclusively upon historical market equity risk premiums which is in direct contrast to Staff's use of both historical and projected growth rates in its application of the DCF model. As stated previously, the cost of capital is

21 Morin 133.

22 Brealey, R.A. and Myers, S.C., <u>Principles of Corporate Finance Fifth Edition</u> (McGraw-Hill Publications, Inc., 1996) 146-147.

prospective and while the arithmetic mean of long-term historical stock market returns can provide insight into investors' expectations of stock market returns because the arithmetic mean of historical returns provides investors with the valuable insight needed to estimate future risk, it is also appropriate to use an estimate of the forecasted or projected stock market return. One indication of the forecasted stock market return can be derived using Value Line's 3-5 year median total market price appreciation projections and dividend yield projections as explained in detail on pages 47 and 48 of my direct testimony and derived in note 3 on page 3 of Schedule PMA-12. Based upon Value Line, a forecasted total market return of 16.86% is indicated using the same three months, July, August, and September 2011, used by Staff in developing the dividend yield in its DCF analysis. When the average forecasted yield on 30-year U.S. Treasury bonds for 2012 and 2013, derived from Staff's Schedule 5 and discussed above, of 4.95% is subtracted from Value Line's forecasted total market return, a forecasted market equity risk premium of 11.91% results which, when averaged with the historical market equity risk premium of 6.70% as reported by 2011SBBI, results in a market equity risk premium of 9.31%.

Q. You have stated that Staff also failed to apply the ECAPM to account for the fact that Security Market Line (SML) as described by the traditional CAPM is not as steeply sloped as the predicted SML. Please comment.

A. As discussed in my direct testimony at page 51, line 14 through page 52, line 4 and again at page 54, line 13 through page 56, line 8 of my direct testimony, while numerous tests of the CAPM have confirmed its validity, these tests have determined that "the implied intercept term exceeds the risk-free rate and the slope term is less than predicted by the CAPM."[23] These tests have also indicated that the expected return on a security is related to its risk by the following formula:

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

Some critics of the ECAPM model claim that using adjusted betas in a traditional CAPM amounts to using an ECAPM but such a claim is not valid. As discussed in my direct testimony, using adjusted betas in a CAPM analysis is not equivalent to the ECAPM. Betas are adjusted because of the regression tendency of betas to converge toward 1.0 <u>over time</u>, i.e., over successive calculations of beta. As discussed previously, numerous studies have determined that the SML described by the CAPM formula at <u>any given moment</u> in time is not as steeply sloped as the predicted SML. As noted in my direct testimony, at pages 54 and 55, Morin[24] states:

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

[23] Morin 175.

[24] Morin 191.

> 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, the slope of the SML should not be confused with beta. As also noted in my direct testimony at page 55, Eugene F. Brigham, finance professor emeritus and the author of many financial textbooks states[25] :

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

Q. What would Staff's CAPM results have been had Staff relied upon a correctly-derived historical market equity risk premium, included a forecasted market equity risk premium, a forecasted risk-free rate as well as the ECAPM?

A. In Column 4 on Schedule PMA-23, I have derived the traditional CAPM, the version applied by Staff, using a Staff provided average forecasted risk-free rate of 4.95% for 2012 and 2013 and an average market equity risk premium based upon the arithmetic mean historical market equity risk premium, correctly calculated as described above, coupled with a forecasted market equity risk

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

premium. This results in a traditional CAPM-derived common equity cost rate of 11.93%. In Column 5 on Schedule PMA-23, I have derived an ECAPM, based upon the forecasted risk-free rate and correctly-derived average historical and projected market equity risk premium. The ECAPM-derived common equity cost rate is 12.51%.

When averaged, the traditional CAPM results of 11.93% and the ECAPM results of 12.51% result in a CAPM of 12.23%. Such a cost rate corroborates neither Staff's range of DCF results of 8.97% - 9.97% nor its recommended range of common equity cost rate of 9.40% - 10.40%. In addition, these cost rates are further understated because they do not reflect either MAWC's greater unique business risks relative to of Staff's proxy group of six water companies, the greater financial risk of Staff's recommended common equity ratios or flotation costs.

Recommended Common Equity Cost Rate

Q. Please discuss Staff's recommended common equity cost rate range of 9.40% - 10.40%, with a midpoint of 9.90%.

A. Staff's recommended common equity cost rate range of 9.40% - 10.40% is inadequate for three reasons; 1) such a cost rate range provides an insufficient achieved return on the book common equity of MAWC; and, 2) such a cost rate does not adequately reflect either MAWC's greater risk relative to Staff's proxy group due to its unique risks, the greater financial risk of Staff's recommended common equity ratios or flotation costs.

Q. How does Staff's recommended range of common equity cost rate of 9.40% -

10.40% with a midpoint of 9.90% compare with the expected ROEs of its prosy group of six water companies?

A. It is far below the level of earnings expected by Value Line for the four companies in its group of six comparable water utility companies for which Value Line publishes a projected ROE for the years 2014-2016. The latest (October 21, 2011) Value Line Ratings & Reports (Standard Edition) for American States Water Company, Aqua America, Inc., California Water Service Group and SJW Corporation, (there are no projections for Connecticut Water Service, Inc. or York Water Company) indicate that Value Line expects them to earn 12.0%, 12.5%, 11.0 and 8.0% on year-end book common equity (see Schedule PMA-39) over the next 3-5 years averaging, 10.9%. While these forecasts are for earnings on book common equity, it must be remembered that the return on common equity authorized in this proceeding will be applied to the book value of the common equity financed portion of MAWC's and will therefore become MAWC's opportunity for earnings on book value. An opportunity to earn a range of return on book common equity of either Staff's recommended range of 9.40% - 10.40%, or Staff's recommended midpoint of 9.90% is woefully inadequate in comparison with these expected returns on book common equity of comparable water companies.

Such a common equity cost rate range is also inconsistent with the comparability of returns standard enunciated in the Hope decision which states:

> The return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding

risks.

Therefore, Staff's recommended common equity cost rate range should be rejected by the MoPSC in setting rates for MAWC in this proceeding.

Q. Previously you noted that Staff's recommended common equity cost rate range of 9.40% - 10.40%, with a midpoint of 9.90% does not adequately reflect either MAWC's greater risk relative to Staff's proxy group due to its unique risks, the greater risk of Staff's recommended capital structure ratios or flotation costs. Please explain.

A. As discussed in my direct testimony at page 18, line 1 through page 20, line 23 and in Company Witness Dennis R. Williams direct testimony, MAWC faces unique risks due to the availability and quality of its source of supply; exposure to flooding; non-contiguous service territory, concentration of investment and revenues in a single metropolitan area, St. Louis; and various unique regulatory risks. Because MAWC is nearly identical in size to Staff's proxy group of six water companies as shown on Schedule PMA-24 in my opinion, a business risk adjustment or 0.35% (slightly less than my recommended adjustment of 0.40%) is warranted.

Q. Is there a way to quantify a financial risk adjustment due to the greater financial risk of Staff's recommended capital structure ratios?

A. Although Staff arrived at its recommended common equity cost rate range of 9.40% - 10.40% by adding a credit rating differential of 0.43% to its indicated DCF cost range to reflect American Water's Standard & Poor's (S&P) bond rating of BBB+ relative to the average S&P credit rating of A for its proxy group, Staff has provided no empirical support that MAWC would be assigned a bond / or credit rating of BBB+ by S&P. Therefore, should the MoPSC adopt Staff's recommended common equity ratio, it is necessary to adjust the common equity cost rate to reflect the greater financial risk inherent in Staff's recommended capital structure ratios of 56.76% long-term debt, 0.29% preferred stock and 42.95% common equity. Staff's recommended long-term debt ratio of 56.76% is significantly higher than the average long-term debt ratio of 50.87% for Staff's proxy group of six water companies as can be gleaned from page 1 of Schedule PMA-25. Consequently, an upward adjustment to the indicated common equity cost rate based upon the six water companies is necessary. An indication of the magnitude of the necessary financial risk adjustment is given by the Hamada equation[26], which un-levers and then re-levers betas based upon changes in capital structure. Using the Hamada equation as described in detail on page 63, line 5 through page 65, line 2 of my direct testimony, an upward adjustment for the greater financial risk inherent in Staff's recommended capital structure ratios is 0.75%.

Q. You also previously noted that Staff did not reflect flotation costs in its recommended common equity cost rate. Please comment

A. As discussed on page 65, line 5 through page 67, line 11, of my direct testimony, it is necessary to include flotation costs, i.e., those costs associated with the sale of new issuance of common stock, in the common equity cost rate recommendation. There is no other mechanism in the ratemaking paradigm

[26] Brigham, Eugene F. and Daves, Phillip R., Intermediate Financial Management, 9th Ed., Thomson/Southwestern, 2007, p. 533.

with which such costs can be recovered. Using the methodology described on page 67, lines 5 – 11 of my direct testimony and the corrected Staff DCF cost rate results in a flotation cost adjustment of 0.15%.

Q. What would Staff's recommendation be had Staff properly reflected flotation costs, the greater financial risk inherent in its recommended capital structure and MAWC's greater business risks due to its unique risks?

A. It would be a range of 10.22% - 11.22%, with a midpoint of 10.72%. (10.22% = 8.97% + 0.15% + 0.75% + 0.35%) – 11.22% = 9.97% + 0.15% + 0.75% + 0.35%).

Q. Based upon the corrected Staff DCF and CAPM discussed previously, what would Staff's recommendation be once flotation costs, the greater financial risk inherent in its recommended capital structure and MAWC's greater business risks due to its unique risks are reflected?

A. As shown on Schedule PMA-26, the corrected Staff DCF is 10.53% (Line No. 1) and the corrected Staff CAPM is 12.23% (Line No. 2). These cost rates average 11.38% (Line No. 3). When the flotation costs (Line No. 4), financial risk (Line No. 5) and business risk (Line No. 6) adjustments are added, a corrected indicated Staff common equity cost rate of 12.63% results as summarized on Schedule PMA-26.

Q. Are you aware the MoPSC Staff has provided workpapers containing updated Schedules 2-1 through 21 which reflect a range of common equity cost rate of 8.95% - 9.95% with a midpoint of 9.45%?

A. Yes. While recognizing that Mr. Barnes updated schedules as of December 8, 2011 reflect a different return on common equity than originally filed in the Staff Report on November 17, 2011, I have limited this rebuttal testimony to Staff's recommendations of the originally filed Staff Report. However, I reserve the right to file additional rebuttal testimony in response to any rebuttal or supplemental testimony or corrected Staff Report.

MIEC WITNESS MICHAEL P. GORMAN

COMMON EQUITY COST RATE

Current Capital Market Conditions

Q. On page 6, line 9 through page 7, line 2, Mr. Gorman asserts that the cost of capital for utilities is "no higher than it was" in MAWC's last rate case when the order was issued in June 2010. He bases this assertion on the decline of approximately 90-100 basis points in utility bond yields since MAWC's last rate case. All else equal, this would indicate an approximate 50 basis point decline in the cost of capital[27]. While it is true that utility bond yields have declined since June 2010, market equity risk premiums have risen since then, providing an indication that utility equity risk premiums have also risen in response to the recent fragile recovery from the Great Recession. As shown on page 1 on Schedule PMA-27, the projected market equity risk premium based upon a forecasted total return derived from Value Line's 3-5 year average total market appreciation plus average annual forecasted dividend yield at the beginning of each month from June 2011 (the date of the order in MAWC's last rate case)

[27] Morin 128-129.

through December 2011 minus the Blue Chip Financial Forecast consensus estimate of about 50 economists of the expected yield on 30-year U.S. Treasury notes for the following six quarters, also, at the beginning of each month, has risen 131 basis points or 1.31%, from 11.09% in June 2011 to 12.40% in December 2011.

Likewise the actual monthly market equity risk premium for the S&P 500 Composite Index (S&P 500) relative to 30-day U.S. Treasury Bill yields shows increased from a *negative* 8.33% for May 2011 to a *negative* 0.84% for November 2011. Using the actual monthly market equity risk premiums for the S&P 500 from July 1926 through May 2010 and November 2011, respectively, and the Predictive Risk Premium Model™ (PRPM™)[28] described in Schedule PMA-28, predicted market equity risk premiums of 10.40% at May 2011 and 10.52% at November 2011 are indicated, which show a clear increase in the predicted market equity risk premium.

In view of the foregoing, Mr. Gorman's conclusion that utilities' cost of capital has declined based solely on a review of the trend in public utility bond yields is misleading and incomplete.

Proxy Group Selection

Q. Do you have any comment upon Mr. Gorman's use of a gas utility proxy group in addition to a water utility proxy group?

A. Yes. Mr. Gorman's use of a gas utility proxy group is inappropriate because, as

[28] Ahern, Pauline M, Hanley, Frank J. and Michelfelder, Richard A. (2011) "A New Approach to Estimating the Cost of Common Equity Public Utilities." Journal of Regulatory Economics, 40:261-278, DOI 10.1007/s11149-011-9160-5.

discussed at page 7, line 13 through page 17, line 23 of my direct testimony and shown on Schedules PMA-2 and PMA-3, the water utility industry faces unique investment risks relative to the electric, combination electric and gas and natural gas utility industries. Using a proxy group comprised of natural gas distribution companies for an ROE analysis for a water company, like MAWC, cannot reflect specific water industry risk, and is therefore inadequate for water utility cost of capital purposes. Consequently, I find it unnecessary to discuss the results pertaining to Mr. Gorman's gas utility proxy group because those results are not reflective of the unique risks of water utilities in general, nor of MAWC, specifically.

Discounted Cash Flow Model (DCF)

Q. Please comment upon Mr. Gorman's discussion of the results of his application of the constant growth, or single stage, DCF model.

A. Mr. Gorman, as shown on page 1 of Schedule MPG-5 and on page 18, Table 4 of his direct testimony, derived an average constant growth DCF model cost rate of 10.81% for his water proxy group and a median of 11.82%. These cost rates include a *negative* 1.08% constant growth DCF result for Middlesex Water Company (Middlesex) because the single security analysts' forecast of EPS growth for Middlesex is a *negative* 5.00% as shown on page 2 of Schedule MPG-4. Since it is illogical that investors would invest with the expectation of losing money, Middlesex's *negative* 1.08% DCF result is not meaningful. Schedule PMA-29 recalculates Mr. Gorman's average and median constant growth DCF results excluding Middlesex. They are 12.51%

and 11.93%, respectively. However, these cost rates do not reflect MAWC's lower financial risk and greater unique business risks relative to the proxy group of water companies nor flotation costs which will be discussed subsequently.

Nevertheless, Mr. Gorman concludes that the constant growth DCF result for his water proxy group is unreasonably high on page 18, lines 3 and 4 because it reflects a growth rate which he claims "is far too high to be a reasonable or reliable estimate of a long-term sustainable growth rate."

His conclusion is based upon his contention that projected growth in Gross Domestic Product (GDP) "represents a ceiling, or high-end, sustainable growth rate for a utility over an indefinite period of time", because the dividend growth for the market as a whole tracked the GDP growth rate during the period 1926 through 2008 as noted on page 20, lines 4 – 26 of Mr. Gorman's direct testimony. Those reasons, however, are not persuasive.

Hence, there is no basis for ultimately rejecting the corrected average constant growth DCF cost rate of 12.51% or median cost rate of 11.93% for his water proxy group.

Q. Why are the three-to-five year growth rate projections made by security analysts in earnings per share reasonable to use in a constant growth, single stage, DCF?

A. Mr. Gorman's statements are contradicted by his earlier testimony at page 12, line 19 through page 13, line 5 where he states the following:

> [f]or purposes of determining the market-required return on common equity, one must attempt to estimate investors'

> consensus about what the dividend or earnings growth rate will be, and not what an individual investor or analyst may use to form individual investment decisions.
>
> Security analyst growth estimates have been shown to be more accurate predictors of future returns than growth rates derived from historical data. Assuming the market generally makes rational investment decisions, forward-looking growth projections are more likely to be the growth estimates considered by the market that influence observable stock price than are growth rates derived from only historical data.

As previously discussed in detail in this rebuttal testimony, there is a wealth of empirical and academic literature, including Cragg and Malkiel and Vander Weide and Carleton, which support the superiority of analysts' forecasts of EPS as measures of investor expectations.

Moreover, Myron Gordon, who first introduced the standard DCF model adopted for utility ratemaking, which both Mr. Gorman and I use, came to recognize that his original "Gordon Model" had a serious limitation by assuming that dividend expectations can be represented by retention growth. Dr. Gordon later came to the conclusion that security analysts' growth forecast in earnings per share were superior predictors of the variation in stock prices.

In all of the previously cited studies, the referenced analyst's growth forecasts were forecasts of growth in EPS. As the recent volatility of the stock market has shown, EPS is a prime, but not the sole, driver of market price movements Therefore, analyst's forecasts of EPS growth are extremely relevant to investors in making their investments decisions. It is the goal of rate of return analysts, such as Mr. Gorman and myself and to which he agrees, to emulate investor behavior. Therefore, consistent with the EMH, the foundation of modern investment theory, the market prices of securities reflect all relevant information at all times. This implies that prices adjust instantaneously to new information, such as analysts' forecasts of EPS growth.

In addition, as noted above, Agrawal and Chen concluded that analysts are not able to systematically mislead investors with optimistic stock recommendations.

Q. At lines 7 through 12 on page 20 of his direct testimony, Mr. Gorman quotes Eugene F. Brigham and Joel F. Houston, in support of his "contention that over the long term, a company's earnings and dividends will grow at a comparable rate to the growth rate of the U.S. GDP." Please comment.

A. I do not have a copy of the specific text book cited by Mr. Gorman. However, the quotation also appears on page 164 of Intermediate Financial Management[29]. In Intermediate Financial Management, the quotation does not end at the conclusion of Mr. Gorman's citation. The entire paragraph reads:

> The constant growth model is often appropriate for mature companies with a stable history of growth. Expected growth rates vary somewhat among companies, but dividend growth for most mature firms is generally expected to continue to the future at about the same rate as nominal grow domestic product (real GDP plus inflation). On this basis, one might expect the dividends of an average, or "normal," company to grow at a *rate of 5 to 8 percent a year.* (italics added for emphasis)

Continuing, on pages 165 through 167, the authors provide an example of the application of the non-constant DCF, assuming a normal growth rate of 8% which they identify as "the assumed average for the economy." Thus,

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29 Brigham and Daves, 164-167.

assuming that this same information appears in <u>Fundamentals of Financial Management,</u> from which Mr. Gorman quoted, although he relied upon the Brigham / Houston quotation to support the use of the growth in nominal GDP for use in a non-constant DCF model, Mr. Gorman ignored the authors recommendation of an assumed 8% normal growth rate to be used in the non - constant DCF

Q. At lines 13 – 26 on page 20 of his direct testimony, Mr. Gorman cites page 67 of Morningstar, Inc.'s <u>2009 SBBI</u> to support using GDP growth as a maximum sustainable growth rate. Please comment

A. The study reported in the <u>2009 SBBI</u> relates growth in the earnings and dividends of the stock market as a whole to GDP growth from 1926-2008. Since the stock market as a whole, whether measured by the NYSE or the S&P 500, is a broad based representation of all the common stocks traded in the U.S., it stands to reason that the earnings and dividends of the market as a whole would track GDP growth. However, neither the <u>2009 SBBI</u> nor Mr. Gorman have provided any empirical support that the earnings and dividends of utility companies, in general, or water companies, in particular, or indeed any specific company or industry, track GDP growth.

Q. On page 19, lines 21 - 23, Mr. Gorman states that "[h]ence, nominal GDP growth is a very conservative, albeit overstated, proxy for utility sales growth, rate base growth, and earnings growth." Please comment.

A. Mr. Gorman has provided no empirical evidence that in the third stage of a multi-stage DCF analysis any company, especially the relatively stable and mature utility companies, would grow at the average growth rate of the U.S. economy. The average growth in the U.S. economy is just that, an average. Some companies will grow faster and some will grow more slowly. That the growth in nominal GDP is an average is demonstrated on Schedule PMA-30 which shows the nominal GDP for the years 2001-2010 as a whole and by industry. From 2009-2010, nominal GDP grew 3.83% and 4.73% on average for the nine years ending 2010. In contrast, the construction component of nominal GDP declined 5.93% from 2009 to 2010 and grew a meager 0.34% on average for the nine years ending 2010. Likewise, the utilities component of nominal GDP grew 2.83% from 2009 to 2010 and an average 6.14% for the nine years ending 2010. In addition, it is a mismatch to use five- to ten-years growth in GDP as a proxy either for the years eleven through perpetuity. There is no evidence that a five- to ten-years growth rate in GDP accurately represents the in perpetuity growth rate in GDP.

Hence, there is no valid rationale for undertaking a multi-stage DCF analysis.

Q. Do you agree with Mr. Gorman's use of a sustainable growth constant growth DCF analysis?

A. No. As shown on pages 1 and 2 of Schedule MPG-8, he calculates sustainable growth for each company in his water proxy group based upon 3-5 year projections from Value Line. His allowance for growth caused by the sale of new common stock above book value is also based upon the five-year growth in shares from 2010 through 2014-2016. Hence, Mr. Gorman's sustainable growth methodology is a short-term forecast, no longer than the security analysts' five-year forecasts of EPS growth used in his first consensus analyst's growth constant growth DCF analysis. Moreover, he has provided no empirical support that sustainable growth accurately represents investors' expected growth.

Moreover, the sustainable growth methodology is inherently circular because it relies upon an expected ROE on book common equity which is then used in a DCF analysis to establish a common equity cost rate related to the market value of the common stock which, if authorized as the allowed ROE in this proceeding, will become the expected ROE on book common equity. Mr. Gorman's 9.67% sustainable growth constant growth DCF result, which forms the basis, in part, of his recommended allowed DCF derived ROE on book common equity, is lower than the expected average Value Line ROE of 10.78% shown on page 1 of Schedule MPG-8 for the very proxy group used to derive his recommended allowed ROE. Schedule PMA-31, an excerpt from Roger A. Morin's book New Regulatory Finance, which corroborates the circular nature of sustainable growth.

In view of the foregoing, it is clear that Mr. Gorman's application of the sustainable growth constant growth DCF is circular and ignores the basic principle of rate base / rate of return regulation, namely, that the cost of equity which will be authorized in this proceeding will be applied to the jurisdictional book value rate base of MAWC and become the allowed future earned return on book common equity, i.e., the expected ROE component of the sustainable growth method.

In view of all of the foregoing, the use of analysts' forecasts of EPS growth should not be rejected when estimating today's market cost of capital. There is no need to reject the empirical evidence of the proven reliability of analysts' forecasts of EPS by turning to either a sustainable growth constant growth or a multi -stage DCF model.

Risk Premium Model (RPM)

Q. Do you have any comments regarding Mr. Gorman's risk premium analysis?

A. Yes. My comments center on the time period over which he estimates the equity risk premium and his use of authorized returns to do so.

Q. Do you agree with Mr. Gorman's use of the years 1986 – 3rd quarter 2011 to determine an equity risk premium?

A. No. Mr. Gorman states on page 27, line 10 through page 28, line 6 of his direct testimony that he relied upon the period 1986 through the 3rd quarter 2011, because public utility stocks have consistently traded at a premium to book value during that time. He concludes, on lines 1 and 2 on page 28, that "[o]ver this time period, regulatory authorized returns were sufficient to support market prices that at least exceeded book value." Use of such a short time period is especially inappropriate and inconsistent in view of his use of a multi-stage growth DCF model and his emphasis upon long-term sustainable growth. As discussed previously in this rebuttal testimony and my direct testimony, the <u>2011 SBBI</u> makes it clear that the arbitrary selection of short historical periods is highly suspect and unlikely to be representative of long-term trends in market data. Page 9 of Schedule PMA-22 clearly shows that it is inappropriate to estimate a market equity risk premium over a short period of time. For example on page 7 the 2008 SBBI states:

> The estimate of the equity risk premium depends on the length of the data series studied. . . requires a data series long enough to give a reliable average. . . because an average of the realized equity risk premium is quite volatile when calculated using a short history, using a long series makes it less likely that the analyst can justify any number he or she wants. . .

As discussed in my direct testimony on page 38, lines 1 - 10, Bonbright, *et al* make it very clear that the market prices of the common stocks of public utilities are influenced by factors which are beyond the direct influence of the regulatory process. In addition, Phillips[30] states:

> Many question the assumption that market price should equal book value, believing that 'the earnings of utilities should be sufficiently high to achieve market-to-book ratios which are consistent with those prevailing for stocks of unregulated companies.'

Schedule PMA-32 demonstrates that there is no relationship between the market-to-book ratios and the earned rates of return on book common equity for the S&P Industrial Index and its successor, the S&P 500 Composite Index over a long period of time. On Schedule PMA-32, I have shown the market-to-book ratios, rates of return on book common equity (earnings/book ratios), annual inflation rates, and the earnings/book ratios net of inflation (real rate of earnings) annually for the years 1947 through 2010. In each and every year, the market-to-book ratios of the S&P Industrial Index equaled or exceeded 1.00

[30] Id., at p. 395.

times. In 1949, the only year in which the market-to-book ratio was 1.00 (or 100%), the real rate of earnings on book equity, adjusted for deflation, was 18.1% (16.3% + 1.8%). In contrast, in 1961, when the S&P Industrial Index experienced a market-to-book ratio of 2.01 times, the real rate of earnings on book equity for the Index was only 9.1% (9.8% - 0.7%). In 1997, the preliminary market-to-book ratio for the Index was 5.57 times, while the average real rate of earnings on book equity was 21.6% (23.3% - 1.7%).

This analysis clearly demonstrates that competitive, unregulated companies have never sold below book value, on average, and have sold at book value in only one year since 1947. The data show that there is no relationship between earnings/book ratios and market-to-book ratios.

Because this lack of a relationship between earnings/book ratios and market-to-book ratios covers a 64-year period, 1947 through 2010, it cannot be validly argued that going forward a relationship would exist between earnings/book ratios and market-to-book ratios. The analysis shown on Schedule PMA-32, coupled with the supportive academic literature, demonstrate the following:

1. that while regulation is a substitute for marketplace competition, it can influence but not directly control market prices, and, hence, market-to-book ratios; and,
2. that the rates of return investors expect to achieve and which influence their willingness to pay market prices well in excess of book values have no meaningful, direct relationship to rates of earnings on

book equity.

Because this lack of relationship between earnings/book ratios and market-to-book ratios covers a period of nearly 65 years, it is not reasonable to assume that a direct relationship will exist between rates of earnings on book common equity and market-to-book ratio into the future. Schedule PMA-32 confirms that while regulation is a substitute for marketplace competition, it has but a limited effect on, but no direct control over the market prices and hence market-to-book ratios of regulated utilities. Thus, no valid conclusion of equity risk premia can be drawn for the 1986 to first quarter 2008 because of market-to-book ratios in excess of one.

Have you applied an appropriate risk premium model to Mr. Gorman's water and gas distribution proxy groups?

A. Yes. That information is shown on Schedule PMA-33. Using the same risk premium methodology described in my direct testimony on page 40, line 7 through page 50, line 13, a risk premium indicated common equity cost rate is 10.61% for Mr. Gorman's proxy group of water companies based upon market conditions at the time he prepared his direct testimony as summarized on page 1, Schedule PMA-33. However, this cost rate does not reflect MAWC's lower financial risk and greater unique business risks relative to the proxy group of water companies nor flotation costs which will be discussed subsequently.

Capital Asset Pricing Model

Q. Please comment upon Mr. Gorman's application of the CAPM.

A. Mr. Gorman's application of the CAPM is flawed for three reasons. First, his derivation of the market equity risk premium is incorrect. Second, his "forward-looking" equity risk premium is not truly a prospective equity risk premium. Third, Mr. Gorman failed to utilize the ECAPM in addition to the traditional CAPM.

Q. How is Mr. Gorman's historical market equity risk premium incorrectly derived?

A. Mr. Gorman's market equity risk premium is the difference between the arithmetic mean 1926-2010 total return on large company stocks of 11.9% and the arithmetic mean 1926-2010 total return on long-term government bonds of 5.9% from the 2011 SBBI which results in a 6.0% market equity risk premium. As discussed previously, the correct derivation of the historical market equity risk premium is the difference between the total return on large company stocks of 11.9% and the arithmetic mean 1926-2010 income return on long-term government bonds of 5.2%, resulting in a market equity risk premium of 6.7%. As discussed previously, the income return on long-term government bonds is the appropriate return to use in the estimation of the market equity risk premium because it represents the riskless portion of the return as discussed previously and noted by the 2011 SBBI in Schedule PMA-22.

Q. Why is Mr. Gorman's "forward-looking" equity risk premium not truly forward-looking?

A. Mr. Gorman derived his "forward-looking" equity risk premium by merely adding a current consensus analysts' inflation projection to the 2011 SBBI's long-term historical arithmetic mean real market return for the years 1926-2010. It is not appropriate to try and match a current forecast of inflation, 2.3% from *Blue*

Chip Financial Forecasts, with an average real market return over a period of 85 years. In my opinion, investors would not attempt to do such a thing. Rather, they would be influenced by a forecast such as that published by Value Line which is widely subscribed to and is available in the business reference section of most libraries. A more appropriate method of deriving the prospective equity market return is based upon Value Line's projected 3-5 year market appreciation potential, which when converted to an annual rate plus the market's median expected dividend yield results in a forecasted total annual market return of 18.29% for the thirteen-weeks ending October 21, 2011 and derived as explained in Note 3 on page 2 of Schedule PMA-12. This methodology yields a truly prospective market return which is based upon an important investor-influencing publication.

Q. Why should Mr. Gorman have included an ECAPM analysis in deriving his CAPM-based common equity cost rate?

A. As discussed previously in this rebuttal testimony and in my direct testimony at page 51, line 14 through page 52, line 4 and again at page 54, line 13 through page 56, line 8, the empirical Security Market Line (SML) described by the traditional CAPM is not as steeply sloped as the predicted SML. As Morin[31] notes:

> . . .low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.

Hence, both the traditional CAPM and ECAPM should be used in deriving

[31] Morin,175.

a CAPM-based common equity cost rate. I have shown the results of applying both the traditional CAPM and ECAPM to Mr. Gorman's water companies using a correctly derived historical market equity risk premium. As shown on page 1 of Schedule PMA-34 the traditional CAPM result is 11.71%, while the ECAPM result is 12.39%. The average of both cost rates is 12.05%. However, this cost rate does not reflect MAWC's lower financial risk and greater unique business risks relative to the proxy group of water companies nor flotation costs which will be discussed subsequently.

Financial Integrity

Q. Please comment upon Mr. Gorman's financial integrity analysis at page 37, line 13 through page 40, lint 12 of his direct testimony.

A. In view of S&P's revised financial matrix, Mr. Gorman's comparison to the former S&P financial benchmark financial ratios is misplaced and should be disregarded, notwithstanding his qualification on page 38, lines 6 – 8 of his direct testimony, that the "the effect of integrating the utility metrics with those of general corporate bonds resulted in a reduction to the transparency in S*P's credit metric guideline for utilities."

Mr. Gorman has provided no empirical evidence to assume that American Water is an appropriate "risk proxy affiliate" for MAWC. As discussed previously in this rebuttal testimony, American Water has regulated operations in twenty (20) states, thus benefiting from geographical and regulatory diversity. Also, American Water is a much large company than MAWC. Clearly, the risks of American Water on a consolidated basis are not similar to those of MAWC.

Moreover, S&P is clear in its description of its revised ratings matrix that they do not assign a credit, bond rating, business or financial risk profile based upon a spot financial metrics as Mr. Gorman has done on page 33 of his direct testimony. On pages 4 and 5 of Schedule PMA-4, S&P states:

> The rating matrix indicative outcomes are what we typically observe – but are not meant to be precise indications or guarantees of future rating opinions. . . . Still, it is essential to realize that the financial benchmarks are guidelines, neither gospel nor guarantees. . . .Moreover, our assessment of financial risk is not as simplistic as looking at a few ratios.

Recommended Common Equity Cost Rate

Q. Do the corrected MIEC DCF, RPM and CAPM, discussed previously, adequately reflect flotation costs, the lower financial risk inherent in MAWC's capital structure and MAWC's greater business risks due to its unique risks are reflected?

A. No. As discussed in my direct testimony at page 18, line 1 through page 20, line 23 and in Company Witness Dennis R. Williams direct testimony, MAWC faces unique risks due to the availability and quality of its source of supply; exposure to flooding; non-contiguous service territory, concentration of investment and revenues in a single metropolitan area, St. Louis; and various unique regulatory risks. Because Mr. Gorman's proxy group is nearly identical in size to my proxy group of water companies as shown on Schedule PMA-24, in my opinion, my originally recommended business risk adjustment 0.40% is warranted.

Q. Is there a way to quantify a financial risk adjustment due to the slightly lower financial risk of MAWC's capital structure ratios?

A. Mr. Gorman accepted the Company's capital structure ratios. Although Mr. Gorman concluded that they were similar to those of his proxy group, MAWC's capital structure actually contains somewhat less financial risk that the proxy group, as the proxy group's average long-term debt ratio at December 2010 was 50.73% as shown on Schedule PMA-25, in comparison with MAWC's requested long-term debt ratio of 49.36%. Therefore, it is necessary to adjust the common equity cost rate to reflect the lower financial risk inherent of MAWC's capital structure ratios relative to Mr. Gorman's proxy group. Consequently, an upward adjustment to the indicated common equity cost rate based upon the six water companies is necessary. An indication of the magnitude of the necessary financial risk adjustment is given by the Hamada equation[32], which un-levers and then re-levers betas based upon changes in capital structure. Using the Hamada equation as described in detail on page 63, line 5 through page 65, line 2 of my direct testimony, a downward adjustment for the greater financial risk inherent in MAWC's capital structure ratios is 0.21%.

Q. You also previously noted that Mr. Gorman did not reflect flotation costs in its recommended common equity cost rate. Please comment

A. As discussed on page 65, line 5 through page 67, line 11, of my direct

[32] Brigham and Daves, 533.

testimony, it is necessary to include flotation costs, i.e., those costs associated with the sale of new issuance of common stock, in the common equity cost rate recommendation. There is no other mechanism in the ratemaking paradigm with which such costs can be recovered. Using the methodology described on page 67, lines 5 – 11 of my direct testimony and the corrected Staff DCF cost rate results in a flotation cost adjustment of 0.16%.

Q. Based upon the corrected MIEC DCF, RPM and CAPM discussed previously, what would Mr. Gorman's recommendation be once flotation costs, the lower financial risk inherent in MAWC's capital structure and MAWC's greater business risks due to its unique risks are reflected?

A. As shown on Schedule PMA-35, the corrected MIEC DCF is 11.93% (Line No. 1), the corrected MIEC RPM is 10.61% (Line No. 2) and the corrected MIEC CAPM is 12.05% (Line No. 3). These cost rates average 11.53% (Line No. 4). When the flotation costs (Line No. 5), financial risk (Line No. 6) and business risk (Line No. 7) adjustments are added / subtracted, a corrected indicated MIEC common equity cost rate of 12.63% results a summarized on Schedule PMA-35.

BJC WITNESS BILLIE SUE LACONTE

COMMON EQUITY COST RATE

Discounted Cash Flow Model

Q. Please comment upon Ms. LaConte's applications of the DCF model.

A. On page 3, lines 3 - 7, Ms. LaConte states that she has used three applications of the DCF model: the constant growth version using security analyst's growth forecasts;, the constant growth version using GDP growth; and, a two-stage DCF model using security analysts' growth as well as long-term GDP growth forecasts. As previously discussed in this rebuttal testimony, neither the use of GDP growth nor a multi-stage DCF, e.g., a two-stage DCF is appropriate for estimating the cost of common equity in for companies in general, or for utilities, specifically. Therefore, I will limit my comments to her constant growth DCF application using security analysts' growth forecasts.

As Mr. Gorman has done, Ms. LaConte included Middlesex's *negative* forecasted EPS growth rate from Reuter's. This is incorrect because, as stated previously, investors do not invest with the expectation of losing money. Schedule PMA-36 recalculates Ms. LaConte's single stage constant growth DCF analysis excluding Middlesex's negative Reuter's forecasted growth rate in EPS. As shown, the average DCF result is 10.5% and the median is 9.8%. As with both Staff's and MIEC's analyses, these cost rates do not adequately reflect MAWC's financial risk and greater unique business risks relative to the proxy group of water companies nor flotation costs as will be discussed subsequently.

Capital Asset Pricing Model

Q. Please comment upon Ms. LaConte's application of the CAPM.

A. Ms. LaConte's application of the CAPM is flawed for two reasons. First, her derivation of the market equity risk premium is incorrect. Second, Ms. LaConte failed to utilize the ECAPM in addition to the traditional CAPM.

Ms. LaConte relied exclusively upon an historical market equity risk premium which is in direct contrast to her use of projected growth rates in her applications of the DCF model. As stated previously, the cost of capital is prospective and while the arithmetic mean of long-term historical stock market returns can provide insight into investors' expectations of stock market returns because the arithmetic mean of historical returns provides investors with the valuable insight needed to estimate future risk, it is also appropriate to use an estimate of the forecasted or projected stock market return. An appropriate method of deriving the prospective equity market return is based upon Value Line's projected 3-5 year market appreciation potential, which when converted to an annual rate plus the market's median expected dividend yield results in a forecasted total annual market return of 18.98% for the thirteen-weeks ending November 11, 2011 and derived as explained in Note 3 on page 2 of Schedule PMA-12. This methodology yields a truly prospective market return which is based upon an important investor-influencing publication.

Ms. LaConte also failed to utilize an ECAPM. As discussed previously in this rebuttal testimony and in my direct testimony at page 51, line 14 through page 52, line 4 and again at page 54, line 13 through page 56, line 8, the empirical Security Market Line (SML) described by the traditional CAPM is not as steeply sloped as the predicted SML. As Morin[33] notes:

> . . .low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted.

Hence, both the traditional CAPM and ECAPM should be used in deriving

[33] Morin,175.

a CAPM-based common equity cost rate. I have shown the results of applying both the traditional CAPM and ECAPM to Ms. LaConte's water companies using a correctly derived historical market equity risk premium. As shown on page 1 of Schedule PMA-37, the traditional CAPM result is 12.05%, while the ECAPM result is 12.79%. The average of both cost rates is 12.42%. However, once again, this cost rate does not reflect MAWC's lower financial risk and greater unique business risks relative to the proxy group of water companies nor flotation costs which will be discussed subsequently.

Recommended Common Equity Cost Rate

Q. Do the corrected BJC DCF and CAPM results discussed previously adequately reflect flotation costs, the lower financial risk inherent in MAWC's capital structure and MAWC's greater business risks due to its unique risks are reflected?

A. No, they do not. As discussed in my direct testimony at page 18, line 1 through page 20, line 23 and in Company Witness Dennis R. Williams direct testimony, MAWC faces unique risks due to the availability and quality of its source of supply; exposure to flooding; non-contiguous service territory, concentration of investment and revenues in a single metropolitan area, St. Louis; and various unique regulatory risks. Because Ms. LaConte's proxy group is identical to my proxy group of water companies as shown on Schedule PMA-24, in my opinion, my originally recommended business risk adjustment 0.40% is warranted.

Q. Is there a way to quantify a financial risk adjustment due to the slightly lower financial risk of MAWC's capital structure ratios?

A. Although Ms. LaConte did not address the capital structure issue, she based her recommended common equity cost rate upon the market data of my proxy group of nine water companies. As discussed on page 24, lines 7 – 17 of my direct testimony, MAWC's ratemaking capital structure ratios contain less financial risk than those of the proxy group making it is necessary to adjust the common equity cost rate to reflect this lower financial risk. Consequently, an upward adjustment to the indicated common equity cost rate based upon the six water companies is necessary. An indication of the magnitude of the necessary financial risk adjustment is given by the Hamada equation[34], which un-levers and then re-levers betas based upon changes in capital structure. Using the Hamada equation as described in detail on page 63, line 5 through page 65, line 2 of my direct testimony, a downward adjustment for the greater financial risk inherent in MAWC's capital structure ratios is 0.21%.

Q. You also previously noted that Ms. LaConte did not reflect flotation costs in its recommended common equity cost rate. Please comment

A. As discussed on page 65, line 5 through page 67, line 11, of my direct testimony, it is necessary to include flotation costs, i.e., those costs associated with the sale of new issuance of common stock, in the common equity cost rate recommendation. There is no other mechanism in the ratemaking paradigm with which such costs can be recovered. Using the methodology described on

[34] Brigham and Daves, 533.

page 67, lines 5 – 11 of my direct testimony and the corrected MIEC DCF cost rate results in a flotation cost adjustment of 0.16%.

Q. Based upon the corrected BJC DCF and CAPM discussed previously, what would Ms. LaConte's recommendation be once flotation costs, the lower financial risk inherent in MAWC's capital structure and MAWC's greater business risks due to its unique risks are reflected?

A. As shown on Schedule PMA-38, the corrected BJC DCF is 10.49% (Line No. 1), and the corrected BJC CAPM is 12.42% (Line No. 2). These cost rates average 11.46% (Line No. 3). When the flotation costs (Line No. 4), financial risk (Line No. 6) and business risk (Line No. 7) adjustments are added / subtracted, a corrected indicated BJC common equity cost rate of 11.803% results a summarized on Schedule PMA-38.

UPDATED OVERALL COST OF CAPITAL AND RATE OF RETURN ON COMMON EQUITY

Q. Have you updated your recommended rate of return on common equity for MAWC?

A. Yes. Page 1 of Schedule PMA-39 shows the updated overall rate of return for MAWC of 9.10% using the capital structure ratios and senior capital cost rates at December 31, 2011 and my updated common equity cost rate recommendation of 11.85%. In arriving at my updated common equity cost rate recommendation, I have applied the same four cost of common equity models in an identical manner to the current market data of the same proxy group of water companies as in my direct testimony.

Q. Does that conclude your rebuttal testimony?

A. Yes.

Exhibit No.:	
Issues:	Rate of Return on Equity
Witness:	Pauline M. Ahern
Exhibit Type:	Direct Schedules
Sponsoring Party:	Missouri-American Water Company
Case Nos.:	WR-2011-0337
Date:	January 19, 2012

PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

CASE NO. WR-2011-0337

EXHIBIT

TO ACCOMPANY THE

REBUTTAL TESTIMONY

OF

PAULINE M. AHERN, CRRA

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

JEFFERSON CITY, MISSOURI

Missouri-American Water Company
Derivation Implied Return on Common Equity (ROE) Based upon MoPSC Staff's
Recommended Overall Rate of Return

Line No.		MoPSC Staff's Recommended Overall Rate of Return: Capital Structure Ratios (1)	Cost Rate (1)	Weighted Cost Rate: After-Inc. Tax	Weighted Cost Rate: Before Inc. Tax
1.	Long-Term Debt	56.76%	6.19%	3.51%	3.51%
2.	Preferred Stock	0.29%	9.21%	0.03%	0.05% (2)
3.	Common Equity'	42.95%	9.90%	4.25%	6.54% (2)
4.				7.79%	10.10%

		Missouri-American Water Co.'s Requested Capital Structure Ratios (3)	Missouri-American Water Co.'s Requested Cost Rate (3)	Weighted Cost Rate: After-Inc. Tax	Weighted Cost Rate: Before Inc. Tax
5.	Long-Term Debt	49.36%	6.36%	3.14%	3.14%
6.	Preferred Stock	0.27%	9.23%	0.02%	0.03% (3)
7.	Common Equity'	50.37%	**8.93%** (4)	4.50% (5)	6.93% (6)
8.				7.66%	10.10% (7)

Notes:
(1) From Schedule 21 of the MoPSC Staff Report.
(2) Before income tax weighted cost rate of preferred stock and common equity. 0.05% = (0.03 / (1 - 0.35%)) and 6.54% = (4.25% / (1 - 0.35%)).
(3) From Schedule 1, page 1 of the Exhibit accompanying Ms. Ahern's direct testimony.
(4) Implied return on common equity based upon MoPSC Staff's recommended overall rate of return. 8.93% = (4.50% / 50.37%).
(5) After income tax weighted cost of common equity based upon MoPSC Staff's recommended overall rate of return. 4.50% = (6.93% * (1 - 0.35%)).
(6) Before income tax weighted cost of common equity based upon MoPSC Staff's recommended overall rate of return. 6.93% = 10.10% - 0.03% - 3.14%.
(7) From Line No. 4 above.

REBUTTAL TESTIMONY OF
BURTON G. MALKIEL
ON BEHALF OF
SOUTH CAROLINA ELECTRIC AND GAS COMPANY
DOCKET NO. 2002-223-E

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Burton G. Malkiel and my business address is Princeton University, Princeton, NJ 08544-1021.

Q. HAVE YOU PREVIOUSLY FILED TESTIMONY IN THIS PROCEEDING?

A. Yes.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. My rebuttal testimony addresses issues raised by Michael Gorman (on behalf of the South Carolina Energy Users Committee ("SCEUC")) in his direct testimony, including his criticism of my reliance upon the discounted cash flow ("DCF") model for estimating the cost of equity capital for South Carolina Electric and Gas Company ("SCE&G"), and by David C. Parcell (on behalf of the South Carolina Consumer Advocate ("CA") and South Carolina Merchants Association ("SCMA")) in his direct testimony, including his criticism of my reliance upon securities analysts' projected growth rates in my DCF analysis and my

These costs have been fully incurred, are real costs of assessing capital markets, and should be included in any fair analysis to determine SCE&G's cost of equity capital. My analysis includes flotation cost, as does Commission Staff witness Spearman, and it is my recommendation that SCE&G be permitted to recover these legitimate and real costs of raising equity capital for the benefit of its operations and customers.

Q. WITNESS PARCELL ON PAGE 27, LINES 12-23 EXPLAINS THAT HE USED A COMBINATION OF "FIVE INDICATORS OF GROWTH IN [HIS] DCF ANALYSIS." THEN, ON PAGE 40-43, WITNESS PARCELL CRITICIZES YOUR RELIANCE UPON SECURITIES ANALYSTS' PROJECTED GROWTH RATES IN YOUR DCF ANALYSIS TO THE EXCLUSION OF MR. PARCELL'S SELECTION OF GROWTH INDICATORS. PLEASE RESPOND TO WITNESS PARCELL'S SELECTION OF GROWTH INDICATORS AND HIS CRITICISM OF YOUR USE OF SECURITIES ANALYSTS' PROJECTED GROWTH RATES IN YOUR DCF ANALYSIS.

A. In my book with John Cragg entitled, *Expectations of the Structure of Share Prices*[5], Dr. Cragg and I studied analysts' forecasts over very long periods of time. One of the main findings of the study published in this book was that the most effective predictor of future growth was securities analysts' forecasts. Constructed growth rates based either upon historical growth or retention rates and historical rates of return on equity are unreliable and are not nearly as effective predictors of future growth as analysts' forecasts. Consequently, Mr. Parcell's DCF analysis significantly underestimates SCE&G's true cost of equity capital because he utilized constructed growth rates using historical data and retention rates, when the proven choice, and the most direct and most effective predictor of future growth is analysts' forecasts.

Also, please note that Witness Gorman agrees with the finance community's use of analysts' forecasts. On lines 10-11, page 8 of his testimony, Gorman notes that "[s]ecurity analysts' growth estimates have been shown to be more accurate predictors of future returns than growth rates derived from historical data."

Witness Parcell also criticizes my use of securities analysts' forecasts in performing my DCF analysis, arguing that analysts' forecasts include an upward bias rendering them suspect as a reliable predictor of future growth rates. This question has been a matter of particular interest and study for me and, as stated earlier, was a focus of the Cragg-Malkiel book. Another main finding of the book was that analysts' forecasts are not always overly optimistic. In some periods they

[5] John Cragg and Burton G. Malkiel, *Expectations and the Structure of Share Prices*, (University of Chicago Press, 1982.)

are indeed overly optimistic. In other periods they are, however, not optimistic enough.

In the 1990's, I agree that there was over-optimism in securities analysts' forecasts. This was especially true in the late 1990's during a period that I describe as the biggest bubble of all times in the soon to be published eighth edition of my book, *A Random Walk Down Wall Street.* It is also true that analysts' projections were tainted by their firms' investment banking connections. To support his argument, Witness Parcell includes a quote from a speech delivered on March 26, 2002 by Federal Reserve Chairman Alan Greenspan. In relevant part Mr. Greenspan states as follows:

> "I suspect that with the underlying database publicly available, it is just a matter of time before the ex post results of analysts' recommendations are compiled and published on a regular basis. I venture to say that with such transparency, the current upward bias of analysts' earnings projections would diminish rather rapidly, because investment firms are well aware that security analysis without credibility has no market value."

I agree with Mr. Greenspan when he states that the upward bias of analysts' earnings projections would diminish rather rapidly once their work is transparent to the public. With all the publicity given to tainted analysts' forecasts in investigations instituted by the New York Attorney General, the National Association of Securities Dealers, and the Securities & Exchange Commission, I believe the upward bias, that existed in the late 1990's has indeed diminished. In summary, I believe that current analysts' forecasts are more reliable than they were during the late 1990's. Therefore, analysts' forecasts remain the proper tool to use in performing a Gordon Model DCF analysis.

Q. ON PAGES 33-37 OF HIS PREFILED DIRECT TESTIMONY, WITNESS PARCELL SETS FORTH THE RESULTS OF HIS COMPARABLE EARNINGS ANALYSIS. DO YOU AGREE WITH HIS ANALYSIS AND CONCLUSIONS?

A. No. First I would note that all statistics based on book values are suspect. Book values depend on depreciation policies, policies with respect to write-offs, etc., and are generally not comparable among companies. Second, Mr. Parcell admits that his recommended rate of return for SCE&G would lead to a fall in the price to book value ratio, i.e., the stockholders would be made worse off. If companies are to be allowed rates of return that enable them to raise new capital, then those rates cannot be ones that cause their stock prices to decline.

Q. IN YOUR OPINION WOULD THE COST OF EQUITY CAPITAL ESTIMATES PROPOSED BY CA AND SCMA WITNESS PARCELL AND SCEUC WITNESS GORMAN PROVIDE SCE&G WITH FAIR AND REASONABLE RETURNS ON ITS PLANT AND FACILITIES DEVOTED TO PUBLIC USE? PLEASE EXPLAIN.

Do Analyst Conflicts Matter? Evidence from Stock Recommendations

Anup Agrawal *University of Alabama*
Mark A. Chen *Georgia State University*

Abstract

We examine whether conflicts of interest with investment banking and brokerage businesses induce sell-side analysts to issue optimistic stock recommendations and, if so, whether investors are misled by such biases. Using quantitative measures of potential conflicts constructed from a novel data set containing revenue breakdowns of analyst employers, we find that recommendation levels are indeed positively related to conflict magnitudes. The optimistic bias stemming from investment banking conflicts was especially pronounced during the late-1990s stock market bubble. However, evidence from the response of stock prices and trading volumes to upgrades and downgrades suggests that the market recognizes analysts' conflicts and properly discounts analysts' opinions. This pattern persists even during the bubble period. Moreover, the 1-year stock performance following revised recommendations is unrelated to the magnitude of conflicts. Overall, our findings do not support the view that conflicted analysts are able to systematically mislead investors with optimistic stock recommendations.

1. Introduction

In April 2003, 10 of the largest Wall Street firms reached a landmark settlement with state and federal securities regulators on the issue of conflicts of interest

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faced by stock analysts.[1] The settlement requires the firms to pay a record $1.4 billion in compensation and penalties in response to government charges that the firms issued optimistic stock research to win favor with potential investment banking (IB) clients. Part of the settlement funds are earmarked for investor education and for provision of research from independent firms. In addition to requiring large monetary payments, the settlement mandates structural changes in the firms' research operations and requires the firms to disclose conflicts of interest in analysts' research reports.

The notion that investors are victims of biased stock research presumes that (1) analysts respond to the conflicts by inflating their stock recommendations and (2) investors take analysts' recommendations at face value. Even if analysts are biased, it is possible that investors understand the conflicts of interest inherent in stock research and rationally discount analysts' opinions. This alternative viewpoint, if accurate, would lead to very different conclusions about the consequences of analysts' research. Indeed, investors' rationality and self-interested behavior imply that stock prices should accurately reflect a consensus about the informational quality of public announcements (Grossman 1976; Grossman and Stiglitz 1980). Rational investors would recognize and adjust for analysts' potential conflicts of interest and thereby largely avoid the adverse consequences of biased stock recommendations.

In this article, we provide evidence on the extent to which analysts and investors respond to conflicts of interest in stock research. We address four questions. First, is the extent of optimism in stock recommendations related to the magnitudes of analysts' conflicts of interest? Second, to what extent do investors discount the opinions of more conflicted analysts? In particular, do stock prices and trading volumes react to recommendation revisions in a manner that rationally reflects the degree of analysts' conflicts? Third, is the medium-term (that is, 3- to 12-month) performance of recommendation revisions related to conflict severity? And, finally, did conflicts of interest affect analysts or investors differently during the late-1990s stock bubble than during the postbubble period? The answers to these questions are clearly of relevance to stock market participants, public policy makers, regulators, and the academic profession.

We use a unique, hand-collected data set that contains the annual revenue breakdown for 232 public and private analyst employers. This information allows us to construct quantitative measures of the magnitude of potential conflicts not only from IB business but also from brokerage business. We analyze a sample of over 110,000 stock recommendations issued by over 4,000 analysts during the 1994–2003 time period. Using univariate tests as well as cross-sectional regressions that control for the size of the company followed and individual analysts' experience, resources, workloads, and reputations, we attempt to shed

[1] Two more securities firms (Deutsche Bank Securities Inc. and Thomas Weisel Partners LLC) were added to the formal settlement in August 2004.

light both on how analysts respond to pressures from IB and brokerage businesses and on how investors compensate for the existence of such conflicts of interest.

A number of studies (for example, Dugar and Nathan 1995; Lin and McNichols 1998; Michaely and Womack 1999; Dechow, Hutton, and Sloan 2000; Bradley, Jordan, and Ritter 2008) focus on conflicts faced by analysts in the context of existing underwriting relationships (see also Malmendier and Shanthikumar 2007; Cliff 2007).[2] Our article complements this literature in several ways. First, we take into account the pressure to generate underwriting business from both current and potential client companies. Even if an analyst's firm does not currently do IB business with a company that the analyst tracks, it might like to do so in the future. Second, we examine the conflict between research and all IB services (including advice on mergers, restructuring, and corporate control), rather than just underwriting. Third, we examine conflicts arising from brokerage business in addition to those from IB.[3]

Fourth, the prior empirical finding that underwriter analysts tend to be more optimistic than other analysts is consistent with two alternative interpretations: (*a*) an optimistic report on a company by an underwriter analyst is a reward for past IB business or an attempt to win future IB business by currying favor with the company or (*b*) a company chooses an underwriter whose analyst already likes the stock. The second interpretation implies that underwriter choice is endogenous and does not necessarily imply a conflict of interest. We sidestep this issue of endogeneity by not focusing on underwriting relations between an analyst's firm and the company followed. Instead, our conflict measures focus on the importance to the analyst's firm of IB and brokerage businesses, as measured by the percentage of its annual revenue derived from IB business and from brokerage commissions. Unlike underwriting relations between an analyst's firm and the company followed, the proportions of the entire firm's revenues from each of these businesses can reasonably be viewed as given, exogenous variables from the viewpoint of an individual analyst. Finally, our approach yields substantially larger sample sizes than those used in prior research, and it therefore leads to greater statistical reliability of the results.

Several articles adopt an approach that is similar in spirit to ours. For example, Barber, Lehavy, and Trueman (2007) find that recommendation upgrades (downgrades) by investment banks—which typically also have brokerage businesses—

[2] Bolton, Freixas, and Shapiro (2007) theoretically analyze a different type of conflict of interest in financial intermediation, one faced by a financial advisor whose firm also produces financial products (such as in-house mutual funds). Mehran and Stulz (2007) provide an excellent review of the literature on conflicts of interest in financial institutions.

[3] Hayes (1998) analyzes how pressure on analysts to generate brokerage commissions affects the availability and accuracy of earnings forecasts. Both Irvine (2004) and Jackson (2005) find that analysts' optimism increases a brokerage firm's share of the trading volume. Ljungqvist et al. (2007) find that analysts employed by larger brokerage houses issue more optimistic recommendations and more accurate earnings forecasts. However, none of these articles examines how investors' responses to analysts' recommendations and the investment performance of recommendations vary with the severity of brokerage conflicts, issues that we investigate here.

underperform (outperform) similar recommendations by non-IB brokerages and independent research firms. Cowen, Groysberg, and Healy (2006) find that full-service securities firms—which have both IB and brokerage businesses—issue less optimistic forecasts and recommendations than do non-IB brokerage houses. Finally, Jacob, Rock, and Weber (2008) find that short-term earnings forecasts made by investment banks are more accurate and less optimistic than those made by independent research firms. We extend this line of research by quantifying the reliance of a securities firm on IB and brokerage businesses. This is an important feature of our article for at least two reasons. First, given that many securities firms operate in multiple lines of business, it is difficult to classify them by business lines. By separately measuring the magnitudes of both IB and brokerage conflicts in each firm, our approach avoids the need to rely on a classification scheme. Second, since the focus of this research is on the consequences of analysts' conflicts, the measurement of those conflicts is important. Our conclusions sometimes differ from those in classification-based studies.

We find that analysts do indeed seem to respond to pressures from IB and brokerage businesses: larger potential conflicts of interest from these businesses are associated with more positive stock recommendations. We also document that the distortive effects of IB conflicts were larger during the late-1990s stock bubble than during the postbubble period. Nonetheless, the empirical analysis yields several pieces of evidence to suggest that investors are sophisticated enough to adjust for these biases. First, the short-term reactions of both stock prices and trading volumes to recommendation upgrades are negatively and statistically significantly related to the magnitudes of potential IB or brokerage conflicts. For downgrades, the corresponding relation is negative for stock prices but positive for trading volumes. Second, the 1-year investment performance after recommendation revisions bears no systematic relation to the magnitude of conflicts. Finally, investors continued to discount conflicted analysts' opinions during the bubble period, even amid the euphoria prevailing in the market at the time. Together these results strongly support the idea that the marginal investor, taking analysts' conflicts into account, rationally discounts optimistic stock recommendations.[4]

The remainder of the article is organized as follows. We discuss the issues in Section 2 and describe our sample and data in Section 3. Section 4 examines the relation between recommendation levels and the degree of IB or brokerage conflict faced by analysts. Section 5 analyzes how conflicts are related to the response of stock prices or trading volumes to recommendation revisions. Section

[4] In a companion paper (Agrawal and Chen 2005), we find that analysts appear to respond to conflicts when making long-term earnings growth projections but not short-term earnings forecasts. This finding is consistent with the idea that, with short-term forecasts, analysts worry about their deception being revealed with the next quarterly earnings release, but they have greater leeway with long-term forecasts. We also find that the frequency of forecast revisions is positively related to the magnitude of brokerage conflicts, and several tests suggest that analysts' trade generation incentives impair the quality of stock research.

6 investigates the relation between conflicts and the investment performance of recommendation revisions. Section 7 presents our results for the late-1990s stock bubble and postbubble periods, and Section 8 concludes.

2. Issues and Hypotheses

Investment banking activity is a potential source of analyst conflict that has received widespread attention in the financial media (for example, Gasparino 2002; Maremont and Bray 2004) as well as the academic literature (for example, Lin and McNichols 1998; Michaely and Womack 1999). When IB business is an important source of revenue for a securities firm, a stock analyst employed by the firm often faces pressure to inflate his or her recommendations. This pressure is due to the fact that the firm would like to sell IB services to a company that the analyst tracks.[5] The company, in turn, would like the analyst to support its stock with a favorable opinion. Thus, we expect that the more critical is IB revenue to an analyst's employer, the greater the incentives an analyst faces to issue optimistic recommendations.[6]

Analysts also face a potential conflict with their employers' brokerage businesses. Here, the pressure on analysts originates not from the companies that they follow but from within their employing firms. Brokerage business generates a large portion of most securities firms' revenues, and analyst compensation schemes are typically related explicitly or implicitly to trading commissions. Thus, analysts have incentives to increase trading volumes in both directions (that is, buys and sells). Given the many institutional constraints that make short sales relatively costly, many more investors participate in stock purchases than in stock sales.[7] Indeed, it is mostly existing shareholders of a stock who sell. This asymmetry between purchases and sales implies that the more important brokerage business is to an analyst's employer, the more pressure the analyst faces to be bullish when issuing recommendations.

Analysts who respond to the conflicts they face by issuing blatantly misleading stock recommendations can develop bad reputations that reduce their labor income and hurt their careers.[8] Stock recommendations, however, are not as easily evaluated as other outputs of analysts' research, such as 12-month price targets or quarterly earnings forecasts, which can be judged against public, near-

[5] Throughout this article, we refer to an analyst's employer as a "firm" and a company followed by an analyst as a "company."

[6] Ljungqvist, Marston, and Wilhelm (2006, forthcoming) find that, while optimistic recommendations do not help the analyst's firm win the lead underwriter or comanager positions in general, they help the firm win the comanager position in deals in which the lead underwriter is a commercial bank.

[7] Numerous regulations in the United States increase the cost of selling shares short (see, for example, Dechow et al. 2001). Therefore, the vast majority of stock sales are regular sales rather than short sales. For example, over the 1994–2001 period, short sales comprised only about 10 percent of the annual New York Stock Exchange trading volume (New York Stock Exchange 2002).

[8] See Jackson (2005) for a theoretical model showing that analysts' concerns about their reputations can reduce optimistic biases arising from brokerage business.

term realizations. So it is not clear whether analysts' career concerns can completely prevent them from responding to pressures to generate IB or brokerage business.

The relation between conflict severity and the short-term (2- or 3-day) stock price impact of a recommendation should depend on whether investors react to the opinion rationally or naively.[9] Under the rational discounting hypothesis, the relation should be asymmetric for upgrades and downgrades. For upgrades, the stock price response should be negatively related to the degree of conflict. This implication arises because analysts who face greater pressure from IB or brokerage business are likely to be more bullish in their recommendations, and rational investors should discount an analyst's optimism more heavily. For downgrades, however, the story is different. When an analyst downgrades a stock despite facing large conflicts, rational investors should find the negative opinion more convincing and should be more likely to revalue the stock accordingly. This implies that the short-term stock price response to a downgrade should be negatively related to the degree of conflict.

The rational discounting hypothesis also predicts cross-sectional relations between conflict severity and the short-term trading volume responses to recommendations. As Kim and Verrecchia (1991) demonstrate in a rational expectations model of trading, the more precise a piece of news, the more individuals will revise their prior beliefs and, hence, the more trading that will result. In the present context, investor rationality implies that an upgrade by a highly conflicted analyst represents less precise news to investors, and so such a revision should be followed by a relatively small abnormal volume. But when an analyst downgrades a stock despite a substantial conflict, the signal is regarded as being more precise, and thus the downgrade should lead to relatively large abnormal trading.

By contrast, under the naive investor hypothesis, investors are largely ignorant of the distortive pressures that analysts face and accept analysts' recommendations at face value. This implies that there should be no relation between conflict severity and the short-term response of either stock prices or trading volume to recommendation revisions. Furthermore, the absence of a systematic relation should hold true for both upgrades and downgrades.

What are the implications of the two hypotheses for the medium-term (3- to 12-month) investment performance of analysts' recommendations? Under the rational discounting hypothesis, there should be no systematic relation between the magnitude of conflicts faced by an analyst and the performance of his or her stock recommendations: the market correctly anticipates the potential distortions up front and accordingly adjusts its response. But the naive investor hypothesis predicts that performance should be negatively related to conflict

[9] This framework follows Kroszner and Rajan (1994) and Gompers and Lerner (1999), who analyze the conflicts that a bank faces in underwriting securities of a company when the bank owns a (debt or equity) stake in it.

severity for both upgrades and downgrades. That is, investors ignore analysts' conflicts up front and pay for their ignorance later.

3. Sample and Data

3.1. Sample

Our sample of stock recommendations comes from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file. This file contains data on newly issued recommendations as well as revisions and reiterations of existing recommendations made by individual analysts over the period 1993–2003. Although the exact wording of recommendations can vary considerably across brokerage houses, I/B/E/S classifies all recommendations into five categories ranging from strong buy to strong sell. We rely on the I/B/E/S classification and encode recommendations on a numerical scale from 5 (strong buy) to 1 (strong sell).

Since we are primarily interested in examining how the nature and consequences of analysts' recommendations are related to IB or brokerage business, we require measures of the importance of these business lines to analysts' employers. Under U.S. law, all registered broker-dealer firms must file audited annual financial statements with the Securities and Exchange Commission (SEC) in x-17a-5 filings.[10] These filings contain information on broker-dealer firms' principal sources of revenue, broken down into revenue from IB, brokerage commissions, and all other businesses (such as asset management and proprietary trading). We use these filings to obtain various financial data, including data on our key explanatory variables: the fractions of total brokerage house revenues from IB and from brokerage commissions. Beginning with the names of analyst employers contained in the I/B/E/S Broker Translation file,[11] we search for all available revenue information in x-17a-5 filings from 1994 to 2003.[12] For publicly traded broker-dealer firms, we also use 10-K annual report filings over the sample period to gather information on revenue breakdowns, if necessary. We thus obtain annual data from 1994 to 2003 on IB revenue, brokerage revenue, and other revenue for 188 privately held and 44 publicly traded brokerage houses.[13] For each brokerage house, we match recommendations to the latest broker-year revenue data preceding the recommendation date. Over the sample period, we

[10] The Securities Exchange Act, sections 17(a)–17(e), requires these filings. We accessed them from Thomson Financial's Global Access database and the Securities and Exchange Commission's (SEC's) public reading room in Washington, D.C.

[11] We use the file supplied directly by the Institutional Brokers Estimate System (I/B/E/S) on CD-ROM. This file does not recode the name of an acquired brokerage firm to that of its acquirer for years before the merger.

[12] The electronic availability of x-17a-5 filings is very limited prior to 1994, the year the SEC first mandated electronic form filing. Hence, we do not search for revenue information prior to 1994.

[13] We exclude a small number of firm-years in which the total revenue is negative (for example, because of losses from proprietary trading).

are able to match in this fashion 110,493 I/B/E/S recommendations issued by 4,089 analysts.

All broker-dealer firms are required to publicly disclose their balance sheets as part of their x-17a-5 filings. But a private broker-dealer firm can withhold the public disclosure of its income statement, which contains the revenue breakdown information needed for this study, if the SEC deems that such disclosure would harm the firm's competitive position. Thus, our sample of private securities firms is limited to broker-dealers that disclose their revenue breakdowns in x-17a-5 filings. We examine whether this selection bias affects our main results by separately analyzing the subsample of publicly traded securities firms, for which public disclosure of annual revenue information is mandatory. Our findings do not appear to be affected by this selection bias. All of our results for the subsample of publicly traded securities firms are qualitatively similar to the results for the full sample reported in the article. In the Appendix, we describe the characteristics of disclosing and nondisclosing private securities firms, shed some light on the firms' income statement disclosure decisions, and use a selectivity-corrected probit model to examine whether the resulting selection bias can explain analysts' response to conflicts in these private firms. We find no evidence that selection bias affects our results for these firms.

3.2. Characteristics of Analysts, Their Employers, and Companies Followed

We next measure characteristics of analysts, their employers, and the companies they cover. Prior research (for example, Clement 1999; Jacob, Lys, and Neale 1999) finds that analysts' experience and workloads affect the accuracy and credibility of their research. Using the I/B/E/S Detail History files, we measure an analyst's experience and workloads in terms of all research activity reported in I/B/E/S, including stock recommendations, quarterly and annual earnings-per-share forecasts, and long-term earnings growth forecasts. We measure general research experience as the number of days since an analyst first issued research on any company in the I/B/E/S database and company-specific research experience as the number of days since an analyst first issued research on a particular company. We measure an analyst's workload as the number of different companies or the number of different four-digit I/B/E/S sector industry groups (S/I/Gs)[14] for which the analyst issued research in a given calendar year.

The amount of resources devoted to investment research within brokerage houses also affects the quality of analysts' research (Clement 1999). Larger houses have access to better technology, information, and support staff. Accordingly, we use three measures of brokerage house size: the number of analysts issuing stock recommendations for a brokerage house over the course of a calendar year, book value of total assets, and net sales. All of our subsequent results are qual-

[14] The I/B/E/S sector industry group numbers are six-digit codes that provide information on the industry sectors and subsectors for companies in the I/B/E/S database. We use the first four digits, which correspond to broad industry groupings.

Table 1
Revenue Sources (%) of Analysts' Employers

	Investment Banking		Brokerage Commission		
Recommendation Level	Mean	Median	Mean	Median	Sample Size
5 (Strong buy)	13.94	11.81	29.87	24.09	28,901
4 (Buy)	13.81	11.21	26.68	17.22	37,478
3 (Hold)	12.68	11.13	28.44	24.07	37,883
2 (Sell)	11.61	10.55	23.13	16.12	4,875
1 (Strong sell)	16.27	14.90	33.44	24.95	1,356
p-Value (4 and 5) versus (1 and 2)	.0000	.0000	.0000	.0023	

Note. Shown are the percentages of analyst employer revenues from investment banking and brokerage commissions, by recommendation level. Data are for 110,493 stock recommendations and are drawn from the Institutional Brokers Estimate System U.S. Detail Recommendations History file for 1994–2003.

itatively similar under each of the three size measures. To save space, we report results only of tests based on the first size measure.

To capture the degree to which investors believe that individual analysts have skill in providing timely and accurate research, we use two measures of analysts' reputation. The first is based on *Institutional Investor* (*II*) magazine's All-America Research Team designation. Each year around October 15, *II* mails an issue to subscribers that lists the names of analysts who receive the most votes in a poll of institutional money managers. About 300–400 analysts are identified. We construct a variable that indicates, for each recommendation revision, whether the recommending analyst was named to the first, second, third, or honorable mention team in the latest annual survey. As a complementary, objective measure of analysts' reputation, we use a variable based on the *Wall Street Journal*'s (*WSJ*'s) annual All-Star Analysts Survey. The *WSJ* All-Star Analysts are determined by an explicit set of criteria relating to past stock-picking performance and forecasting accuracy.[15] The survey covers about 50 industries annually and names the top five stock pickers and top five earnings forecasters in each industry.[16]

Tables 1 and 2 report summary data on the characteristics of our sample. In Table 1, both the mean and the median percentages of analyst employer revenues derived from IB decline monotonically over the first four recommendation levels, but these values are the highest for strong sell recommendations. Similarly, it is the brokerage firms issuing strong sell recommendations that generally derive

[15] We recognize that the performance metrics used in the *Wall Street Journal* (*WSJ*) All-Star Analysts Survey are public information and can, in principle, be replicated by investors. However, to the extent that computing and evaluating analysts' performance is a costly activity, being named an All-Star Analyst can still affect an analyst's reputation and credibility.

[16] Since the I/B/E/S Broker Translation File provides only analysts' last names and first initials, in some instances it is not possible to ascertain from the I/B/E/S data alone whether an analyst in our sample was named to the *Institutional Investor* (*II*) or *WSJ* team. For these cases, we determine team membership of analysts from NASD BrokerCheck, an online database (http://www.nasd.com, accessed October 2004) that provides the full names of registered securities professionals as well as their employment and registration histories for the past 10 years. The database also keeps track of analysts' name changes (such as those resulting from marriage).

Table 2
Characteristics of Analysts, Firms, and Companies Followed

Characteristic	Mean	Median	SD	Sample Size
Investment banking revenue (%)	13.60	11.25	11.93	94,892
Brokerage commission revenue (%)	28.74	24.07	24.75	94,892
Analyst's company-specific experience (years)	2.42	1.20	3.29	85,531
Analyst's general experience (years)	6.41	4.90	5.32	85,531
Analysts employed by a firm	86.34	60	79.73	94,618
Companies followed by an analyst	17.24	15	12.93	84,016
Four-digit I/B/E/S S/I/Gs followed by an analyst	3.05	3	1.90	84,014
Institutional Investor All-America stock picker	.005	0	.07	85,531
Institutional Investor All-America Research Team member	.035	0	.18	85,531
Wall Street Journal All-Star stock picker	.018	0	.13	85,531
Wall Street Journal All-Star Analyst	.136	0	.34	85,531
Market capitalization ($ millions)	8,804.46	1,367.22	27,758.81	81,333
Analyst following	9.14	7	6.88	92,869

Note. Data are for 94,892 recommendation revisions and are drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Recommendation revisions include recommendation changes as well as initiations, resumptions, and discontinuations of coverage. Analysts' experience is measured from all analyst research activity reported in I/B/E/S, including earnings-per-share forecasts, long-term earnings growth forecasts, and stock recommendations. An analyst is considered to be a top stock picker or team member if he or she appeared in the relevant portion of the most recent analyst survey by *Institutional Investor* or the *Wall Street Journal* at the time of a recommendation revision. Market capitalization is measured 12 months before the end of the current month, and analyst following is measured on the basis of stock recommendation coverage. Market capitalization values are inflation adjusted (with Consumer Price Index numbers and with 2003 as the base year). S/I/G = sector industry group.

the highest percentage of their total revenues from brokerage commissions. Notably, in each of the five categories, the mean percentage of revenue from commissions is about twice as large as the mean percentage of revenue from IB. This fact underscores the importance of trading commissions as a source of revenue for many securities firms. The last column shows that about 95 percent of the recommendations in the sample are at levels 5 (strong buy), 4 (buy), or 3 (hold). Levels 1 (strong sell) and 2 (sell) represent only about 1 percent and 4 percent of all recommendations, respectively.

The data in Table 2 provide a flavor of our sample of analysts and their employers. As noted by Hong, Kubik, and Solomon (2000), careers as analysts tend to be relatively short. The median recommendation is made by an analyst with under 5 years of experience, of which just over a year was spent following a given stock. Stock analysts tend to be highly specialized, following a handful of companies in a few industries. The median recommendation is made by an analyst following 15 companies in three industries who works for a securities firm employing 60 analysts. Being named as an All-America Research Team member by *II* is a rare honor, received by under 5 percent of all analysts in our sample. Finally, the typical company followed is large, with mean (median) market capitalization of about $8.8 billion ($1.4 billion) in inflation-adjusted

2003 dollars. Over the time span of a year, a company is tracked by a mean (median) of 9.1 (7) analysts.

4. Conflicts and the Levels of Analyst Recommendations Net of the Consensus

In this section, we examine whether the level of an analyst's stock recommendation net of the consensus (that is, median) recommendation level is related to the conflicts that he or she faces. We start by ascertaining the level of the outstanding recommendation on each stock by each analyst following it at the end of each quarter (March, June, September, December) from 1995 through 2003. An analyst's recommendation on a stock is included only if it is newly issued, reiterated, or revised in the preceding 12 months.

We estimate a regression explaining individual analysts' net stock recommendation levels at the end of a quarter (which is the recommendation level minus the median recommendation level across all analysts following a stock during the quarter).[17] The regression pools observations across analysts, stocks, and quarters and includes our two main explanatory variables: the percentage of an analyst employer's total revenues from IB and the percentage from brokerage commissions. Following Jegadeesh et al. (2004) and Kadan et al. (forthcoming), who find that momentum is an important determinant of analysts' recommendations, we control for the prior 6-month stock return.

The regression also controls for other factors that can affect the degree of analysts' optimism, such as the size of the company followed and the resources, reputation, experience, and workload of an analyst. As a measure of the resources available to an analyst, a dummy variable is used for a large brokerage house, and it equals one if the firm ranks in the top quartile of all houses in terms of the number of analysts employed during the year. The size of the company followed is measured by the natural logarithm of its market capitalization, measured 12 months before the end of the month. We measure an analyst's reputation by dummy variables that equal one if the recommending analyst was named in the most recent year as an All-America Research Team member by *II* or as an All-Star Analyst by the *WSJ*. An analyst's company-specific research experience is measured by the natural logarithm of one plus the number of days an analyst has been producing research (including earnings-per-share forecasts, long-term growth forecasts, or stock recommendations) on the company. We measure an analyst's workload by the natural logarithm of one plus the number of companies for which he or she produces forecasts or recommendations in the current year.

Finally, we control for industry and time period effects by adding dummy variables for I/B/E/S two-digit S/I/G industries and for each calendar quarter (March 1995, June 1995, and so forth). Since net recommendation levels can

[17] To ensure meaningful variation in the dependent variable, we omit stocks followed by only one analyst in a quarter.

Table 3

Ordered Probit Analysis of Recommendation Levels Net of the Consensus

Explanatory Variable	Coefficient	*z*-Statistic
Investment banking revenue (%)	.4167	17.35
Brokerage commission revenue (%)	.0363	3.00
Prior 6-month stock return	−.0068	−2.89
Large brokerage house dummy	−.0639	−8.60
Company size	.0038	2.89
Institutional Investor All-America Research Team dummy	.0032	.15
Wall Street Journal All-Star Analyst dummy	−.0196	−2.23
Company-specific research experience	.0012	1.42
Number of companies followed	.0070	4.64

Note. The results are from ordered probit regressions explaining individual analysts' stock recommendation levels net of the consensus (that is, median) recommendation level at the end of each quarter (March, June, September, December) for 1995–2003. Observations are excluded if the analyst issued no new or revised recommendation in the preceding 12 months. The regression includes observations pooled across analysts, stocks, and quarters. Data on recommendations are drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Investment banking or brokerage commission revenue refer to the percentage of the brokerage firm's total revenues derived from investment banking or brokerage commissions. The large brokerage house dummy is an indicator variable that equals one if a brokerage house is in the top quartile of all houses, based on the number of analysts issuing stock recommendations listed in I/B/E/S in a given calendar year. Company size is the natural logarithm of the market capitalization of the company followed, measured 12 months prior to the end of the current month. The *Institutional Investor* All-America Research Team and *Wall Street Journal* All-Star Analyst dummies are indicator variables that equal one if the recommending analyst was listed as an All-America Research Team member or All-Star Analyst in the most recent analyst ranking. Company-specific research experience is the natural log of one plus the number of days that an analyst has been issuing I/B/E/S research on a company. Number of companies followed equals the natural log of one plus the number of companies followed by an analyst in the current calendar year. The regression includes dummy variables for two-digit I/B/E/S sector industry group industries and for calendar quarters. Test statistics are based on a robust variance estimator. The number of observations is 213,011; the p-value of the χ^2 test is <.0001.

take ordered values from −4 (strongly pessimistic) to 4 (strongly optimistic) in increments of .5, we estimate the regression as an ordered probit model.[18] The Z-statistics are based on a robust (Huber-White sandwich) variance estimator.

Table 3 shows the regression estimate. The coefficients of IB revenue percentage and commission revenue percentage are both positive. This finding implies that greater conflicts with IB and brokerage businesses lead an analyst to issue a higher recommendation on a stock relative to the consensus. Stocks followed by busier analysts and stocks of larger companies receive higher recommendations relative to the consensus. Stocks that experience a price run-up over the prior 6 months, stocks followed by analysts at large brokerage houses, and stocks followed by *WSJ* All-Star Analysts all receive lower recommendations relative to the consensus. All of these relations are highly statistically significant.

To provide a sense of the magnitude of the main effects of interest, we show in Table 4 the derivatives of the probability of each net recommendation level

[18] Notice that recommendation levels can take integer values from 1 to 5, and the median recommendation can take values from 1 to 5 in increments of .5. See Greene (2003) for a detailed exposition of the ordered probit model.

Table 4

Marginal Effects and Sample Distribution for the Ordered Probit Regression in Table 3

	Recommendation Level Net of the Consensus														
	−4	−3.5	−3	−2.5	−2	−1.5	−1	−.5	0	.5	1	1.5	2	2.5	3
Investment banking revenue (%)	−.00031	−.0002	−.0026	−.0010	−.0199	−.0086	−.0744	−.0321	.0123	.0325	.0671	.0077	.0188	.0002	.0003
Brokerage commission revenue (%)	−.00003	−.00001	−.0002	−.00009	−.0017	−.0008	−.0065	−.0028	.0011	.0028	.0059	.0007	.0016	.00002	.00003
Observed frequency	.0001	.0001	.0016	.0007	.0176	.0094	.1241	.0948	.4940	.0937	.1289	.0111	.0233	.0002	.0003

Note. Shown is the derivative of the probability of each net recommendation level with respect to investment banking or brokerage revenue percentage, estimated from the ordered probit regression in Table 3. Investment banking and brokerage commission revenue refer to the percentage of the brokerage firm's total revenues derived from investment banking and brokerage commissions. The last row shows observed frequency of each net recommendation level as a proportion of the sample of 213,011 observations.

with respect to IB revenue and commission revenue percentages.[19] Thus, for example, a 1-standard-deviation increase in IB revenue percentage increases the probability of an optimistic recommendation (that is, a net recommendation level greater than zero) by $.1193 \times (.0325 + .0671 + \ . \ . \ . \ + .0003) = .0151$. Compared to the unconditional probability of an optimistic recommendation by an analyst, this represents an increase of about 5.9 percent (.0151/.2575). The effect of a change in commission revenue percentage is much smaller. A 1-standard-deviation increase in commission revenue percentage increases the probability of an optimistic recommendation by $.2475 \times .01105 = .0027$, or about 1 percent (.0027/.2575) of the unconditional probability. Thus, despite possible concerns about a loss of reputation, analysts seem to respond to conflicts of interest, particularly those stemming from IB.

5. Conflicts and Investor Response to Recommendation Revisions

5.1 Stock Price Response

This section examines whether an analyst's credibility with investors is related to the degree of conflict faced. We interpret the reaction of stock prices to a recommendation revision as an indication of an analyst's credibility. Our analysis focuses on revisions in recommendation levels, rather than on recommendation levels per se, because revisions are discrete events that are likely to be salient for investors, and previous research finds that revisions have significant information content (see, for example, Womack 1996; Jegadeesh et al. 2004). To capture the effects of the most commonly observed and economically important types of revisions, we structure our tests around four basic categories: added to strong buy, added to buy or strong buy, dropped from strong buy, and dropped from buy or strong buy.[20] These four categories are defined to include initiations, resumptions, and discontinuations of coverage because such events also reflect analysts' positive or negative views about a company.[21] Thus, for example, we consider a stock to be added to strong buy under two scenarios: (*a*) the recommendation level is raised to strong buy from a lower level or (*b*) coverage is

[19] Notice that, for each explanatory variable, these derivatives sum to zero across all the net recommendation levels.

[20] Our analysis focuses on these four types of revisions instead of the other four (added to strong sell, and so forth) because, as shown in Table 1, sell and strong sell recommendations are quite rare. But note that dropped-from-buy and dropped-from-buy-or-strong-buy revisions can entail movement to the sell or strong sell category.

[21] We use the I/B/E/S Stopped Recommendations file to determine instances in which a brokerage firm discontinued coverage of a company. This file contains numerous cases in which an analyst stops coverage of a stock only to issue a new recommendation a month or two later. Conversations with I/B/E/S representatives indicate that such events likely represent pauses in coverage due to company quiet periods or analysts' reassignments within a brokerage house. We define a stopped coverage event to be a true stoppage only if the analyst does not issue a recommendation on the stock over the subsequent 6 months.

initiated or resumed at the level of strong buy.[22] Defining revisions in this fashion yields a sample of 94,892 recommendation revisions made over the 1994–2003 period.

5.1.1. Average Response

We compute the abnormal return on an upgraded or downgraded stock over day t as the return (including dividends) on the stock minus the return on the Center for Research in Security Prices equal-weighted market portfolio of New York Stock Exchange (NYSE), American Stock Exchange, and NASDAQ stocks. The cumulative abnormal return (CAR) on the stock over days t_1 to t_2 relative to the revision date (day 0) is measured as the sum of the abnormal returns over those days. Table 5 shows mean and median CARs for three windows: days -1 to 0, -1 to 1, and -5 to 5. The t-statistics for the difference of the mean abnormal returns from zero are computed as in Brown and Warner (1985) and are shown in parentheses. The p-values for the Wilcoxon test are reported in parentheses with the medians.

It is clear from Table 5 that recommendation revisions have large effects on stock prices. For example, when a stock is added to the strong-buy list, it experiences a mean abnormal return of about 2 percent over the 2-day revision period. Downgrades have even larger effects on stock prices than do upgrades. Strikingly, the 2-day mean abnormal return around the dropped-from-strong-buy list is -4 percent. Median values are consistently smaller in magnitude than are means, and this finding indicates that some revisions lead to price reactions of a very large magnitude. Mean and median 2-day abnormal returns are statistically different from zero for all four groups of forecast revisions. The magnitudes of abnormal returns are somewhat larger over the 3-day and 11-day windows than over the 2-day window. Overall, these returns are consistent with those found by prior research that examines the average stock price impact of recommendation revisions (for example, Womack 1996; Jegadeesh et al. 2004).

5.1.2. Cross-Sectional Analysis

Table 6 contains cross-sectional regressions of stock price reactions to recommendation revisions over days -1 to 1. The main explanatory variables of interest in these regressions are our revenue-based measures of the magnitudes of IB and brokerage conflicts. We include controls for the size of an analyst's employer, the size of the company followed, and measures of an analyst's reputation, experience, and workload.[23] We estimate a separate regression for each

[22] Note that the definitions of our four recommendation revision groups imply that stocks can be added to a group more than once on a given day. Nonetheless, excluding days on which a stock experiences multiple revisions does not change any of our qualitative results.

[23] Prior research finds that analysts who have more experience, carry lower workloads, or are employed by larger firms tend to generate more precise research (see, for example, Clement 1999; Jacob, Lys, and Neale 1999; Mikhail, Walther, and Willis 1997). In addition, more reputed analysts tend to generate timelier and more accurate research (see, for example, Stickel 1992; Hong and Kubik 2003). We expect such analysts to be more influential with investors.

Table 5

Cumulative Abnormal Returns surrounding Revisions in Analyst Stock Recommendations

Recommendation Revision	Days −1 to 0			Days −1 to 1			Days −5 to 5		
	Mean (*t*-Statistic)	Median (*p*-Value)	*N*	Mean (*t*-Statistic)	Median (*p*-Value)	*N*	Mean (*t*-Statistic)	Median (*p*-Value)	*N*
Upgrades:									
Added to strong buy	.0207	.0109	24,560	.0240	.0130	24,556	.0263	.0187	24,499
	(49.53)*	(.000)		(46.89)*	(.000)		(26.84)*	(.000)	
Added to buy or strong buy	.0149	.0071	36,879	.0165	.0085	36,875	.0207	.0128	36,780
	(46.47)*	(.000)		(42.01)*	(.000)		(27.53)*	(.000)	
Downgrades:									
Dropped from buy or strong buy	−.0337	−.0126	33,322	−.0358	−.0155	33,262	−.0491	−.0287	33,197
	(−56.21)*	(.000)		(−48.75)*	(.000)		(−34.92)*	(.000)	
Dropped from strong buy	−.0399	−.0153	22,825	−.0427	−.0183	22,795	−.0570	−.0326	22,767
	(−49.88)*	(.000)		(−43.58)*	(.000)		(−30.38)*	(.000)	

Note. The sample of recommendation revisions is drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Recommendation revisions include recommendation changes and initiations, resumptions, and discontinuations in coverage. Day 0 is the revision date. Recommendation revisions are classified according to the level of any existing recommendation and whether coverage is being initiated or dropped. For example, a revision by an analyst is classified as added to strong buy if the new recommendation is strong buy and (*a*) the previous recommendation was lower than strong buy or (*b*) analyst coverage by the brokerage house is resumed or initiated. A recommendation is classified as dropped from strong buy if the previous recommendation was strong buy and (*a*) the new recommendation is lower than strong buy or (*b*) research coverage on the company is stopped. The *t*-statistics for the difference from zero are computed as in Brown and Warner (1985). The *p*-values for the difference from zero are from a Wilcoxon test.

* Statistically significant at the 1% level in two-tailed tests.

Table 6

Cross-Sectional Regressions of Cumulative Abnormal Returns over Days −1 to +1 surrounding Recommendation Revisions

Explanatory Variable	Added to Strong Buy	Added to Buy or Strong Buy	Dropped from Buy or Strong Buy	Dropped from Strong Buy
Intercept	.0369	.0412	−.2294	−.2224
	(7.66)**	(11.21)**	(−31.31)**	(−29.25)**
Investment banking revenue (%)	−.0262	−.0139	−.0200	−.0354
	(−5.65)**	(−3.57)**	(−2.74)**	(−3.92)**
Brokerage commission revenue (%)	−.0187	−.0148	−.0089	−.0013
	(−6.51)**	(−6.43)**	(−2.39)*	(−.29)
Large brokerage house dummy	.0116	.0088	−.0242	−.0220
	(7.46)**	(6.88)**	(−12.79)**	(−10.25)**
Company size	−.0056	−.0041	−.0004	.0018
	(−16.13)**	(−15.40)**	(−.97)	(3.77)**
Institutional Investor All-America Research Team dummy	.0159	.0122	−.0148	−.0207
	(4.11)**	(3.82)**	(−2.93)**	(−3.28)**
Wall Street Journal All-Star Analyst dummy	.0015	.0013	−.0011	.0045
	(.81)	(.84)	(−.48)	(1.78)
Company-specific research experience	.0017	.0019	.0039	.0018
	(8.42)**	(12.49)**	(7.37)**	(3.21)**
Number of companies followed	−.0012	−.0016	.0007	.0008
	(−2.97)**	(−5.37)**	(1.49)	(1.31)
Observations	19,440	28,665	28,618	19,632
Adjusted R^2	.038	.0240	.028	.035
P-Value of *F*-test	<.0001	<.0001	<.0001	<.0001

Note. Shown are coefficient estimates and (in parentheses) *t*-statistics from ordinary least squares regressions. Day 0 is the recommendation revision date. Data on recommendations are drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Investment banking and brokerage commission revenue refer to the percentages of a brokerage firm's total revenues derived from investment banking and brokerage commissions. The large brokerage house dummy is an indicator variable that equals one if a brokerage house is in the top quartile of all houses, based on the number of analysts issuing stock recommendations listed in I/B/E/S in a given calendar year. Company size is the natural logarithm of the market capitalization of the company followed, measured 12 months prior to the end of the current month. The *Institutional Investor* All-America Research Team and *Wall Street Journal* All-Star Analyst dummies are indicator variables that equal one if the recommending analyst was listed as an All-America Research Team member or All-Star Analyst in the most recent analyst ranking. Company-specific research experience is the natural log of one plus the number of days that an analyst has been issuing I/B/E/S research on a company. Number of companies followed equals the natural log of one plus the number of companies followed by an analyst in the current calendar year. All regressions include dummy variables for calendar-year and two-digit I/B/E/S sector industry group industries (not reported). The *t*-statistics are based on a robust variance estimator.

* Statistically significant at the 5% level in two-tailed tests.

** Statistically significant at the 1% level in two-tailed tests.

of the four groups of recommendation revisions. The *t*-statistics based on a robust variance estimator are reported in parentheses.

The coefficient on IB revenue percentage is statistically significantly negative for both upgrades and downgrades. The coefficient on brokerage commission revenue percentage is also negative in all four regressions; it is statistically significant in all cases, except for the dropped-from-strong-buy revisions.[24] Collectively, these results favor the rational discounting hypothesis over the naive investor hypothesis. The magnitudes of these effects are nontrivial. For instance, a 1-standard-deviation increase in IB revenue percentage leads to a change of about −.31 (−.42) percentage points in the 3-day abnormal return around the move to (from) a strong buy recommendation. Similarly, a 1-standard-deviation increase in brokerage commission revenue percentage leads to a change of about −.37 (−.22) percentage points in the corresponding abnormal return around the move to (from) a buy or strong buy recommendation.[25]

The results for control variables are also noteworthy. The dummy variable for a large analyst employer is positively (negatively) related to the market reaction to upgrades (downgrades). This finding is consistent with the idea that revisions by analysts employed at larger brokerage houses (which tend to be more reputable) have more credibility with investors. The size of the company followed is negatively (positively) related to the market reaction to upgrades (downgrades), which is consistent with the notion that, for larger companies, an analyst's recommendation competes with more alternative sources of information and advice.

Revisions by *II* All-America Research Team analysts are positively (negatively) related to the stock price reaction to upgrades (downgrades), which suggests that they wield more influence with investors. This is a notable finding; we are unaware of previous work documenting a relation between an analyst's reputation and the stock price reaction to both upgrades and downgrades. As the coefficient on the *WSJ* All-Star Analyst dummy indicates, however, being designated as a *WSJ* All-Star Analyst does not seem to enhance the credibility of an analyst's recommendations.[26] The absence of an effect here is somewhat

[24] These and all subsequent regression results in this article are qualitatively similar when we winsorize the dependent variable at the first and ninety-ninth percentiles of its distribution.

[25] For each group of revisions (such as added to strong buy), we also estimate the regression after excluding similar revision events that a stock experiences within 3 days of a given revision event. These results are qualitatively similar to those reported in Tables 6 and 8. We also examine the possibility that investors perceived the conflicts to be more severe, and hence discounted them more, in securities firms that were charged by regulators (that is, the 10 firms that were part of the global analyst settlement) than in other firms. We do this by interacting both investment banking (IB) revenue percentage and brokerage commission revenue percentage variables in the regression with binary (0, 1) dummy variables for securities firms that are part of the global analyst settlement and firms that are not. We find no significant differences between the two groups of firms in their coefficients on IB revenue percentage and commission revenue percentage.

[26] Although *II* All-America Research Team and *WSJ* All-Star Analyst dummies both measure aspects of an analyst's reputation, they are not highly correlated. The correlation coefficient is .14 across all upgrades and .13 across all downgrades.

surprising given that the *WSJ* has a much broader readership base than that of *II*. One explanation is that *II* analyst rankings are based on an opinion poll of money managers, who control substantial assets and therefore directly affect stock prices, while *WSJ* rankings are based on strictly quantitative measures of analysts' past stock-picking or forecasting performance.

The market reaction to upgrades is positively related to an analyst's company-specific research experience. This finding suggests that more experienced analysts tend to be more influential with investors. But the reaction to downgrades is also positively related to analysts' experience. Finally, the stock price reaction to upgrades is negatively related to analysts' workload. This finding suggests that busier analysts' opinions tend to get discounted by the market. All of these relations are statistically significant.

5.2. Response of Trading Volume

In this section, we measure analysts' credibility via changes in the volume of trade around recommendation revisions.[27] Revisions of analysts' recommendations can affect trading volumes by inducing investors to rebalance their portfolios to reflect updated beliefs.

5.2.1. Average Response

We compute the abnormal volume for a trading day t as the mean-adjusted share turnover for stock i:[28]

$$e_{it} = v_{it} - v_i, \qquad (1)$$

where v_{it} is the trading volume of stock i over day t divided by common shares outstanding on day t and v_i is the mean of v_{it} over days -35 to -6.

The cumulative abnormal volume (CAV) for stock i over days t_1 to t_2 is measured in the following way:

$$\mathrm{CAV}^i t_1, t_2 = \sum_{t=t_1}^{t_2} e_{it}. \qquad (2)$$

Table 7 shows mean and median CAV values over three windows surrounding revisions in analyst stock recommendations. Over the 2-day revision period, the mean abnormal volume is positive for both upgrades and downgrades, but its magnitude is substantially larger for downgrades. The move to (from) the strong-buy list increases a stock's trading volume by a mean of about .9 percent (2.6 percent) of the outstanding shares, compared to a normal day's volume. For longer windows, the mean abnormal volumes are substantially higher for down-

[27] Many prior studies have used trading volume to examine investors' response to informational events (see, for example, Shleifer 1986; Jain 1988; Jarrell and Poulsen 1989; Meulbroek 1992; Sanders and Zdanowicz 1992).

[28] This approach has been used in a number of prior studies (for example, Shleifer 1986; Vijh 1994; Michaely and Vila 1996).

Table 7

Cumulative Abnormal Trading Volumes surrounding Announcements of Revisions in Stock Recommendations by Analysts

	Days −1 to 0			Days −1 to 1			Days −5 to 5		
Recommendation revision	Mean (*t*-Statistic)	Median (*p*-Value)	*N*	Mean (*t*-Statistic)	Median (*p*-Value)	*N*	Mean (*t*-Statistic)	Median (*p*-Value)	*N*
Upgrades:									
Added to strong buy	.0086	.0011		.0097	.0015		.0071	.0030	
	(8.89)*	(.000)	24,506	(8.18)*	(.000)	24,502	(3.13)*	(.000)	24,488
Added to buy or strong buy	.0053	.0002		.0058	.0004		.0020	.0008	
	(5.08)*	(.000)	36,800	(4.54)*	(.000)	36,796	(.818)	(.000)	36,766
Downgrades:									
Dropped from buy or strong buy	.0217	.0010		.0265	.0014		.0381	.0039	
	(114.47)*	(.000)	33,291	(114.14)*	(.000)	33,232	(85.70)*	(.000)	33,175
Dropped from strong buy	.0259	.0017		.0315	.0025		.0453	.0057	
	(128.76)*	(.000)	22,808	(127.86)*	(.000)	22,779	(96.03)*	(.000)	22,756

Note. The abnormal volume for stock *i* on day *t* is computed from daily Center for Research in Security Prices data as $e_{it} = v_{it} - v_i$, where v_{it} is the volume on day *t* and v_i is the average volume over days −35 to −6 relative to the recommendation revision date (day 0). All share volumes are normalized by dividing by common shares outstanding on the same day. The *p*-values are from a Wilcoxon test.

* Statistically significant at the 1% level in two-tailed tests.

grades. The median values are lower than the mean values. Each mean and median abnormal volume is statistically greater than zero, with a *p*-value below .01. Clearly, revisions of stock recommendations by analysts generate trading.

5.2.2. Cross-Sectional Analysis

Table 8 presents cross-sectional regressions explaining CAVs over days −1 to 1 surrounding the recommendation revisions. The explanatory variables in the regressions are the same as in regressions of CARs in Section 5.1.2. The results provide strong support for the rational discounting hypothesis. The coefficients on both the IB revenue percentage and commission revenue percentage variables are generally statistically significant and negative (positive) for both groups of upgrades (downgrades). The magnitudes of these effects are nontrivial. For example, a 1-standard-deviation increase in IB revenue percentage leads to a change in the 3-day abnormal volume around the addition (omission) of a stock to (from) the strong-buy list of about −.12 percent (.36 percent) of the outstanding shares; a corresponding change in the commission revenue percentage results in a change in the abnormal volume of about −.15 percent (.22 percent).

Recommendation revisions by larger brokerage houses generate more trading. The abnormal volume is also larger for revisions involving smaller companies. Revisions by *II* All-America Research Team members generate statistically significantly more abnormal volume for the dropped from buy or strong-buy group. Upgrades (downgrades) by more experienced analysts result in larger (smaller) abnormal volumes, and upgrades by busier analysts are less credible.

6. Conflicts and the Performance of Recommendation Revisions

We next consider the investment performance of analysts' recommendation revisions over periods of up to 12 months. Here, the choice of the benchmark used to compute abnormal returns is somewhat more important than it is in Section 5.1, where we measure abnormal returns over a few days around the revision. But the results here are likely to be less sensitive to the benchmark employed than are those in studies of long-run stock performance, where the time period of interest can be as long as 5–10 years (see, for example, Agrawal, Jaffe, and Mandelker 1992; Agrawal and Jaffe 2003).

6.1. Average Performance

We use an approach similar to Barber, Lehavy, and Trueman (2007). To evaluate the performance of stocks over a given window, say, months 1–12 following the month of their inclusion (month 0) in a given group of revisions such as the added-to-strong-buy list, we form a portfolio p that initially invests \$1 in each recommendation. Each recommended stock remains in the portfolio until month 12 or the month that the stock is either downgraded or dropped from coverage by the securities firm, whichever is earlier. If multiple securities firms recommend a stock in a given month, the stock appears multiple times in the

Table 8

Cross-Sectional Regressions of Cumulative Abnormal Trading Volumes over Days −1 to +1 surrounding Recommendation Revisions

Explanatory Variable	Added to Strong Buy	Added to Buy or Strong Buy	Dropped from Buy or Strong Buy	Dropped from Strong Buy
Intercept	.0083	.0042	.0946	.0828
	(2.65)**	(1.90)	(13.72)**	(15.01)**
Investment banking revenue (%)	−.0100	−.0085	.0140	.0304
	(−3.31)**	(−2.26)*	(2.18)*	(3.63)**
Brokerage commission revenue (%)	−.0057	−.0059	.0087	.0055
	(−1.76)	(−4.13)**	(2.76)**	(1.45)
Large brokerage house dummy	.0058	.0038	.0168	.0171
	(3.72)**	(4.50)**	(11.12)**	(9.48)**
Company size	−.0031	−.0018	−.0023	−.0041
	(−9.54)**	(−12.30)**	(−7.60)**	(−11.40)**
Institutional Investor All-America Research Team dummy	.0035	.0033	.0084	.0046
	(1.74)	(1.88)	(2.32)*	(1.21)
Wall Street Journal All-Star Analyst dummy	.0008	.0013	.0023	−.0006
	(.74)	(1.42)	(1.36)	(−.29)
Company-specific research experience	.0010	.0010	−.0041	−.0019
	(8.39)**	(11.19)**	(−6.18)**	(−4.11)**
Number of companies followed	−.0009	−.0013	−.0001	−.0005
	(−3.49)**	(−6.23)**	(−.38)	(−.99)
Observations	19,431	28,653	28,594	19,619
Adjusted R^2	.025	.019	.030	.042
p-Value of *F*-test	<.0001	<.0001	<.0001	<.0001

Note. Shown are coefficient estimates and (in parentheses) *t*-statistics from ordinary least squares regressions. Day 0 is the recommendation revision date. Data on recommendations are drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Investment banking and brokerage commission revenue refer to the percentage of brokerage firm's total revenues derived from investment banking and brokerage commissions. The large brokerage house dummy is an indicator variable that equals one if a brokerage house is in the top quartile of all houses, based on the number of analysts issuing stock recommendations listed in I/B/E/S in a given calendar year. Company size is the natural logarithm of the market capitalization of the company followed, measured 12 months prior to the end of the current month. The *Institutional Investor* All-America Research Team and *Wall Street Journal* All-Star Analyst dummies are indicator variables that equal one if the recommending analyst was listed as an All-America Research Team member or All-Star Analyst in the most recent analyst ranking. Company-specific research experience is the natural log of one plus the number of days that an analyst has been issuing I/B/E/S research on a company. Number of companies followed equals the natural log of one plus the number of companies followed by an analyst in the current calendar year. All regressions include dummy variables for calendar-year and two-digit I/B/E/S sector industry group industries (not reported). The *t*-statistics are based on a robust variance estimator.

* Statistically significant at the 5% level in two-tailed tests.

** Statistically significant at the 1% level in two-tailed tests.

portfolio that month, once for each securities firm with a strong buy recommendation. The portfolio return for calendar month t is given by

$$R_{pt} = \sum_{i=1}^{n_t} x_{it} \times R_{it} \Big/ \sum_{i=1}^{n_t} x_{it}, \tag{3}$$

where R_{it} is the month t return on recommendation i, x_{it} is one plus the compound return on the recommendation from month 1 to month $t-1$ (that is, x_{it} equals one for a stock that was recommended in month t), and n_t is the number of recommendations in the portfolio. This calculation yields a time series of monthly returns for portfolio p.

We compute the abnormal performance of portfolio p as the estimate of the intercept term α_p from the Fama and French (1993) three-factor model. Accordingly, we estimate the following time-series regression for portfolio p:

$$R_{pt} - R_{ft} = \alpha_p + \beta_{1p}(R_{mt} - R_{ft}) + \beta_{2p}\text{SMB}_t + \beta_{3p}\text{HML}_t + \varepsilon_{pt},$$
$$t = \text{January 1994 to December 2003}, \tag{4}$$

where R_f is the risk-free rate, R_m is the return on the value-weighted market index, SMB equals the monthly return on a portfolio of small firms minus the return on a portfolio of big firms, and HML is the monthly return on a portfolio of firms with high book-to-market ratio minus the return on a portfolio of firms with low book-to-market ratio. The error term in the regression is denoted ε. The time series of monthly returns on $R_m - R_f$, SMB, and HML are obtained from Kenneth French's Web site.[29] We repeat this procedure for each time window of interest, such as months 1–3, and for each group of revisions, such as the dropped-from-strong-buy list.

Table 9 shows the performance of analysts' recommendation revisions. Over the period of 3 months following the month of recommendation revision, the average abnormal returns for upgrades are positive, and the returns for downgrades are negative. The magnitudes of these returns are nontrivial. For example, the addition of a stock to the strong-buy list has an abnormal monthly return of about .875 percent, or about 2.62 percent over the 3-month period. The pattern is generally similar over longer windows. For example, over months 1–12, the abnormal monthly return for the added-to-strong-buy list is .679 percent, or about 8.15 percent over the 12-month period. The abnormal returns are significantly different from zero for upgrades in all cases; they are statistically insignificant for downgrades in all cases except one.

[29] Kenneth R. French, Fama/French Factors (file F-F_Research_Data_Factors.zip at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html).

Table 9

Medium-Term Investment Performance of Recommendation Revisions

Portfolio	Months 1–3 Abnormal Monthly Return (%)	Months 1–3 *t*-Statistic	Months 1–6 Abnormal Monthly Return (%)	Months 1–6 *t*-Statistic	Months 1–12 Abnormal Monthly Return (%)	Months 1–12 *t*-Statistic
Added to strong buy	.875	6.12**	.758	6.12**	.679	5.70**
Added to buy or strong buy	.586	4.49**	.511	4.82**	.503	5.38**
Dropped from buy or strong buy	−.361	−1.60	−.260	−1.28	−.072	−.44
Dropped from strong buy	−.367	−1.58	−.395	−2.00*	−.231	−1.49

Note. Abnormal returns are reported for three event windows relative to the month of revision (month 0) and are computed using an approach similar to that in Barber, Lehavy, and Trueman (2007). The abnormal return is the estimated intercept from a time-series regression of 114 monthly portfolio returns using the Fama and French (1993) three-factor model.
* Statistically significant at the 5% level in two-tailed tests.
** Statistically significant at the 1% level in two-tailed tests.

6.2. Cross-Sectional Analysis

Table 10 shows the results of a regression similar to that in Section 5.1.2, except that the dependent variable here is the average monthly abnormal return for a firm over months 1–12 following the month of a recommendation revision. We compute this abnormal return by estimating a time-series regression similar to that in equation (4) over months 1–12 for each stock in a sample of recommendation revisions. The intercept from this regression is our estimate of the performance of the recommendation revision. Observations involving recommendation revisions on a stock that occur within 12 months of an earlier revision are omitted from each regression.[30]

In each regression result reported in Table 10, the coefficients of IB revenue percentage and commission revenue percentage are not statistically significantly different from zero. These results favor the rational discounting hypothesis, at least for the marginal investor. The performance of both groups of recommendation upgrades is negatively related to company size; the performance of one group of downgrades is positively related to the dummy variable for *WSJ* All-Star Analysts. None of the other variables is statistically significant.

7. Bubble versus Postbubble Periods

We next exploit the fact that our sample spans both the late-1990s U.S. stock bubble and a postbubble period. During the bubble period, initial public offerings, merger activities, and stock prices were near record highs, and media attention was focused on analysts' pronouncements. We therefore examine whether analysts' behavior and investors' responses to analysts' recommendations differed during the bubble and postbubble periods. Given the euphoria on Wall

[30] The results are qualitatively similar when we include these observations.

Table 10

Cross-Sectional Regressions of Average Monthly Abnormal Returns following Recommendation Revisions over Months 1–12

Explanatory Variable	Added to Strong Buy	Added to Buy or Strong Buy	Dropped from Buy or Strong Buy	Dropped from Strong Buy
Intercept	.0523	.0089	−.0646	−.0821
	(1.81)	(.49)	(−6.81)**	(−6.55)**
Investment banking revenue (%)	−.0089	−.0018	.0042	−.0068
	(−1.23)	(−.29)	(.64)	(−.87)
Brokerage commission revenue (%)	.0064	.0059	.0057	.0031
	(1.32)	(1.54)	(1.21)	(.75)
Large brokerage house dummy	.0009	−.0027	.0016	.0015
	(.38)	(−1.32)	(.72)	(.77)
Company size	−.0013	−.0017	−.0007	−.0007
	(−2.74)**	(−4.18)**	(−1.71)	(−1.54)
Institutional Investor All-America analyst dummy	−.0029	.0001	−.0016	−.0009
	(−.58)	(.01)	(−.44)	(−.23)
Wall Street Journal All-Star Analyst dummy	.0031	.0002	−.0029	.0056
	(1.24)	(.12)	(−1.42)	(2.29)*
Company-specific research experience	.0004	.0004	.0004	.0004
	(1.08)	(1.80)	(.76)	(.92)
Number of companies followed	−.0011	−.0008	−.0002	−.0002
	(−1.61)	(−1.79)	(−.45)	(−.47)
Observations	6,411	8,851	10,644	8,368
Adjusted R^2	.026	.023	.019	.020
p-Value of F-test	<.0001	<.0001	<.0001	<.0001

Note. Shown are the coefficient estimates and (in parentheses) t-statistics from ordinary least squares regressions. Month 0 is the month of recommendation revision. The abnormal return is the estimated intercept from a time-series regression of monthly portfolio returns in accordance with the Fama and French (1993) three-factor model. Data on recommendations are drawn from the Institutional Brokers Estimate System (I/B/E/S) U.S. Detail Recommendations History file for 1994–2003. Investment banking and brokerage commission revenue data refer to the percentage of the brokerage firm's total revenues derived from investment banking and brokerage commissions. The large brokerage house dummy is an indicator variable that equals one if a brokerage house is in the top quartile of all houses, based on the number of analysts issuing stock recommendations on I/B/E/S in a given calendar year. Company size is the natural logarithm of the market capitalization of the company followed, measured 12 months prior to the end of the current month. The *Institutional Investor* All-America Research Team and *Wall Street Journal* All-Star Analyst dummies are indicator variables that equal one if the recommending analyst was listed as an All-America Research Team member or All-Star Analyst in the most recent analyst ranking. Company-specific research experience is the natural log of one plus the number of days that an analyst has been issuing I/B/E/S research on a company. Number of companies followed equals the natural log of one plus the number of companies followed by an analyst in the current calendar year. All regressions include dummy variables for calendar-year and two-digit I/B/E/S sector industry group industries (not reported). The t-statistics are based on a robust variance estimator.

* Statistically significant at the 5% level in two-tailed tests.

** Statistically significant at the 1% level in two-tailed tests.

Table 11

Ordered Probit Regression of Recommendation Levels Net of the Consensus for Bubble versus Postbubble Periods

	Bubble	Postbubble	*p*-Value
Investment banking revenue (%)	.5103*	.3089*	<.001
Brokerage revenue (%)	−.1868*	.2286*	<.001

Note. The explanatory variables are as in Table 3, except that (*a*) the investment banking revenue and brokerage commission revenue percentage variables are interacted with dummy variables for the bubble or postbubble period and (*b*) calendar-quarter dummies are replaced with a postregulation indicator (which is equal to one for quarters after May 2002). Shown are the coefficient estimates of investment banking and brokerage revenue percentage variables for the bubble and postbubble periods and the *p*-value for the difference in the coefficient estimate between the two periods. All test statistics use robust variance estimators.
* Statistically significant at the 1% level in two-tailed tests.

Street and among investors during the bubble, analysts appear to have been under acute pressure to generate IB fees and brokerage commissions. As for the response of investors, the rational discounting hypothesis predicts greater discounting of analysts' opinions during this period in response to heightened conflicts, while the naive investor hypothesis predicts less discounting.

We estimate regressions similar to those for relative recommendation levels (Table 3), those for announcement abnormal returns (Table 6), those for announcement abnormal volumes (Table 8), and those for 12-month investment performance of recommendation revisions (Table 10), except that we now interact IB revenue percentage and commission revenue percentage with dummy variables for the bubble (January 1996–March 2000) and postbubble (April 2000–December 2003) periods. Accordingly, we restrict the sample period for these regressions to January 1996–December 2003. For regressions corresponding to those with results shown in Table 3, we also replace the calendar-quarter dummies with a postregulation indicator (equal to one for quarters ending after May 2002). In May 2002, both the NYSE and the National Association of Securities Dealers considerably tightened the regulations on the production and dissemination of sell-side analyst research.[31] The findings of Barber et al. (2006) and Kadan et al. (forthcoming) suggest that these regulations exerted a downward pressure on recommendation levels. The regression results are presented in Tables 11 and 12. To save space, we report only the coefficient estimates for IB revenue percentage and commission revenue percentage.

The results in Table 11 show that analysts appear to have inflated their recommendations in response to IB conflicts during both the bubble and postbubble periods. But the magnitude of this effect is substantially greater during the bubble period than during the postbubble period. This difference is statistically significant. The magnitude of the effect is smaller for brokerage conflicts than for IB conflicts during both periods. In fact, the effect for brokerage conflicts is negative

[31] See NYSE Amended Rule 472, "Communications with the Public," and National Association of Securities Dealers Rule 2711, "Research Analysts and Research Reports."

Table 12

Ordinary Least Squares Regressions of Abnormal Returns, Abnormal Volumes, and Abnormal Stock Performance for Bubble and Postbubble Periods

	Added to Strong Buy			Added to Buy or Strong Buy			Dropped from Buy or Strong Buy			Dropped from Strong Buy		
	Bubble	Postbubble	*p*-Value	Bubble	Postbubble	*p*-Value	Bubble	Postbubble	*p*-Value	Bubble	Postbubble	*p*-Value
CARs, days −1 to 1:												
Investment banking revenue (%)	−.0248**	−.0120	.083	−.0121**	−.0080	.517	−.0125	−.0379**	.027	−.0361**	−.0345**	.908
Brokerage revenue (%)	−.0114**	−.0105**	.827	−.0099**	−.0110**	.720	−.0063	−.0208**	.003	.0017	−.0114*	.024
CAVs, days −1 to 1:												
Investment banking revenue (%)	−.0076	−.0052	.655	−.0065	−.0082*	.699	.0257**	.0130	.214	.0555**	.0153	.002
Brokerage revenue (%)	−.0042	−.0008	.376	−.0054**	−.0031	.179	.0106*	.0139**	.521	.0046	.0141**	.056
Average monthly CARs, months 1–12:												
Investment banking revenue (%)	−.0016	−.0151	.273	.00001	.0083	.420	−.0085	.0223**	.003	−.0123	−.0051	.564
Brokerage revenue (%)	.0069	.0108	.511	.0086	.0096	.842	.0035	.0136	.101	−.0036	.0091	.019

Note. The explanatory variables are as in Tables 6, 8, and 10, except that the investment banking revenue and brokerage commission revenue percentage variables are interacted with dummy variables for the bubble or postbubble period. Shown are the coefficient estimates of the investment banking and brokerage revenue percentage variables for the bubble and postbubble periods and the *p*-value for the difference in the coefficient estimate between the two periods. Day (month) 0 is the recommendation revision date. All test statistics use robust variance estimators. CAR = cumulative abnormal return; CAV = cumulative abnormal volume.

* Statistically significant at the 5% level in two-tailed tests.

** Statistically significant at the 1% level in two-tailed tests.

during the bubble; it is positive and statistically significantly higher during the postbubble period.

Table 12 shows that, in regressions of 3-day abnormal returns, the coefficients of both IB revenue percentage and commission revenue percentage are negative and statistically significant during the bubble period for both groups of upgrades. For the added-to-strong-buy group, the coefficient of IB revenue percentage is significantly lower during the bubble period than during the postbubble period. For downgrades, the coefficients of both variables are generally negative in both periods, and they are statistically significantly lower during the postbubble period.

In regressions of 3-day abnormal volumes, the coefficients of IB revenue percentage and commission revenue percentage are negative for upgrades and positive for downgrades in all cases, both during and after the bubble. These coefficients are not statistically significantly different between the bubble and postbubble periods for both groups of upgrades and one group of downgrades. For the dropped-from-strong-buy group, the coefficient of IB revenue percentage is statistically significantly larger during the bubble period than during the postbubble period, but the coefficient of the commission revenue percentage is statistically significantly smaller. In regressions of 12-month postrecommendation stock performance, the coefficients of both variables are statistically insignificant both during and after the bubble period in nearly all cases, and this finding is consistent with the results shown in Table 10 for the full sample period.

Overall, analysts appear to respond to IB conflicts both during and after the bubble, but the magnitude of their response declines during the postbubble period. Perversely, while analysts do not seem to respond to brokerage conflicts during the bubble, they appear to do so after the bubble. Perhaps the intense regulatory and media focus on IB conflicts has led analysts to look for alternative avenues. Did investors discount conflicted analysts' opinions more during the bubble than in the postbubble period? The answer to this question is unclear. However, our evidence does not support the notion that investors threw caution to the wind during the bubble.

8. Summary and Conclusions

Following the collapse of the late-1990s U.S. stock market bubble, there has been a widespread hue and cry from investors and regulators over the conflicts of interest faced by Wall Street stock analysts. The discovery of e-mail messages, in which analysts were privately disparaging stocks that they were touting publicly, led to the landmark $1.4 billion settlement between a number of leading Wall Street firms and securities regulators in April 2003. The settlement requires the firms to disclose IB conflicts in analyst reports and imposes a variety of restrictions designed to strengthen the firewalls that separate research from IB. Part of the settlement funds are set aside for investor education and for research produced by independent firms. The settlement basically presumes that analysts respond to the conflicts by inflating their stock recommendations and that investors take analysts' recommendations at face value.

Consistent with the view of the media and regulators, we find that optimism in stock recommendations is positively related to the importance of both IB and brokerage businesses to an analyst's employer. This pattern is more pronounced during the late-1990s stock market bubble with respect to IB conflicts. However, we provide several pieces of empirical evidence that suggest that investors are sophisticated enough to adjust for this bias. First, the short-term reactions of both stock prices and trading volumes to recommendation upgrades vary negatively with the magnitude of potential IB or brokerage conflicts faced by analysts. For instance, over the 3 days surrounding an upgrade to strong buy, a 1-standard-deviation increase in the proportion of revenue from IB is associated with a .31 percentage point decrease in abnormal returns and a .12 percentage point decrease in abnormal volume. These results suggest that investors ascribe lower credibility to an analyst's upgrade when the analyst is subject to greater pressures to issue an optimistic view. For downgrades, conflict severity varies negatively with the short-term stock price reaction and positively with the short-term trading volume impact. This pattern is consistent with the idea that investors perceive an analyst to be more credible if he or she is willing to voice an unfavorable opinion on a stock despite greater pressures to be optimistic.

Second, we find no evidence that the 1-year investment performance of recommendation revisions is related to the magnitude of analysts' conflicts, either for upgrades or for downgrades. This finding suggests that, on average, investors properly discount an analyst's opinions for potential conflicts at the time the opinion is issued. Finally, investors discounted conflicted analysts' opinions during the late-1990s stock bubble, even in the face of the prevailing market euphoria. This evidence does not support the popular view that recommendations of sell-side analysts led investors to throw caution to the wind during the bubble period.

Overall, our empirical findings suggest that while analysts do respond to IB and brokerage conflicts by inflating their stock recommendations, the market discounts these recommendations after taking analysts' conflicts into account. These findings are reminiscent of the story of the nail soup told by Brealey and Myers (1991), except that here analysts (rather than accountants) are the ones who put the nail in the soup and investors (rather than analysts) are the ones to take it out. Our finding that the market is not fooled by biases stemming from conflicts of interest echoes similar findings in the literature on conflicts of interest in universal banking (for example, Kroszner and Rajan 1994, 1997; Gompers and Lerner 1999) and on bias in the financial media (for example, Bhattacharya et al., forthcoming; Reuter and Zitzewitz 2006). Finally, while we cannot rule out the possibility that some investors may have been naive, our findings do not support the notion that the marginal investor was systematically misled over the last decade by analysts' recommendations.

Appendix

This Appendix describes the characteristics of disclosing and nondisclosing private securities firms, sheds some light on their decisions to publicly disclose their income statements, and examines whether the resulting selection bias affects our main results in Table 3. Table A1 provides summary statistics of recommendation levels and characteristics of disclosing and nondisclosing private securities firms. Compared with nondisclosing firms, disclosing firms tend to be smaller and more liquid and issue somewhat more optimistic stock recommendations. The mean recommendation level is slightly higher for disclosing firms than for nondisclosing firms. The median disclosing firm is smaller and holds more liquid assets than the median nondisclosing firm. All these differences are statistically significant. The two groups of firms have similar financial leverage ratios and 2-year growth rates in total assets.

We next examine cross-sectional determinants of a private securities firm's decision to disclose its income statement. In an excellent review of the corporate disclosure literature, Healy and Palepu (2001) point out that a firm is more willing to voluntarily disclose financial information when it needs to raise external financing and when it is less concerned that the disclosure would damage its competitive position in product markets. Ceteris paribus, firms with greater growth opportunities, higher financial leverage, and less liquid resources are more likely to need external financing. They are more likely to be open with potential investors by disclosing financial information, including their income statements. Similarly, smaller firms are likely to have greater need for external financing as they try to grow. In addition, given the intense competition in the securities business, smaller private firms are also likely to be more willing to disclose their profits and profitability because they have less business at stake. For both reasons, smaller firms are likely to be more willing to disclose financial information. We control for firm size by the natural logarithm of one plus total assets in millions of dollars, for growth opportunities by the 2-year growth rate of total assets, for financial leverage by the ratio of long-term debt to total assets, and for liquidity by the ratio of cash and equivalents to total assets. We estimate a probit regression of DISCLOSER, which equals one for a disclosing firm and is zero otherwise.

In accordance with the predictions of corporate disclosure theory, the coefficients on firm size and liquidity are negative, and the coefficient on growth is positive. Contrary to the prediction, however, the coefficient on leverage is negative. All of these coefficients are highly statistically significant. The pseudo-R^2-value of this model is .08. To save space, these results are not shown in a table.

Finally, we examine whether the selection bias caused by a private securities firm's disclosure choice (and, consequently, the availability of data on IB revenue percentage and commission revenue percentage) affects our main results in Table 3. While there is no Heckman selectivity correction for the ordered probit model, there is one for the regular probit model. So we define a binary variable to

Table A1

Summary Statistics for Disclosing and Nondisclosing Private Securities Firms

	Mean			Median			Sample Size	
Variable	Disclosers	Nondisclosers	*P*-Value of *t*-Test	Disclosers	Nondisclosers	*p*-Value of Rank Sum Test	Disclosers	Nondisclosers
Recommendation level:								
Level	3.902	3.810	<.001	4	4	<.001	62,417	181,068
Level minus median level	.036	.010	<.001	0	0	<.001	62,417	181,068
Firm size:								
Total assets ($ millions)	383.37	1,863.52	<.001	4.05	28.43	<.001	365	615
Book equity ($ millions)	26.40	68.98	<.001	1.97	10.56	<.001	365	615
Financial leverage:								
Long-term debt to total assets	.0539	.0653	.253	0	.002	.004	365	615
Total debt to total assets	.0685	.1823	.295	0	.018	<.001	365	615
Liquidity: cash and equivalents to total assets	.2392	.1816	.001	.101	.052	.0001	365	615
2-Year growth rate	.0849	.0697	.440	.052	.020	.099	246	541

Note. Disclosers are brokers that publicly disclose their income statements, while nondisclosers are brokers that do not disclose them. The statistics for recommendation level are computed from individual analysts' recommendation levels at the end of each quarter in the sample. The median recommendation level is computed at the end of each quarter and is based on all analysts recommending a stock. The statistics for broker characteristics are computed across broker years. The firm size statistics are inflation adjusted (with Consumer Price Index numbers and with 2003 as the base year). The 2-year growth rate is $(\text{Total assets}_t / \text{Total assets}_{t-2})^{1/2} - 1$.

measure an optimistic recommendation that equals one if an analyst's recommendation level on a stock exceeds the consensus level and equals zero otherwise. We then replace the dependent variable in the regression in Section 4 with this optimistic recommendation dummy. Using the subsample of private securities firms, we estimate the resulting equation in two ways: (*a*) with a regular probit model and (*b*) with a Heckman selectivity-corrected probit model, where we use the equation described in the second paragraph of this Appendix as the selection equation. When we use approach *b,* the coefficient of the selection term (that is, the inverse Mills ratio) is statistically significant in the second-stage probit regression. What is more important for our purposes is that the sign, magnitude, and statistical significance of our main explanatory variables, the IB revenue percentage and the commission revenue percentage, are similar in the regular probit and the Heckman-corrected probit regressions. These results do not support the idea that our main findings are driven by the selection bias caused by a private securities firm's decision to disclose its revenue breakdown. To save space, these results are not shown in a table.

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Missouri-American Water Company
Correction of MoPSC Witness Barnes' DCF
Using only Security Analysts' Projected Growth in EPS

	[1]	[2]	[3]	[4]	[5]
MoPSC Witness Barnes Proxy Group of Six Water Companies	Expected Annual Dividend (1)	Average High/Low Stock Price (1)	Projected Dividend Yield (1)	Average Projected EPS Growth (2)	Estimated Cost of Common Equity (3)
American States Water Co.	$ 1.18	$ 33.83	3.49%	6.33%	9.82%
Aqua American, Inc.	$ 0.69	$ 21.36	3.23%	8.88%	12.11%
California Water Service Group	$ 0.65	$ 18.15	3.58%	6.00%	9.58%
Connecticut Water Service, Inc.	$ 0.93	$ 26.09	3.56%	6.00%	9.56%
SJW Corp.	$ 0.75	$ 22.87	3.28%	9.75%	13.03%
York Water Co.	$ 0.52	$ 17.07	3.05%	6.00%	9.05%
Average			3.37%	7.16%	10.53%
		Proposed Dividend Yield:			3.37%
		Proposed Range of Growth:			6.00% - 9.75%
		Indicated Range of Common Equity Cost Rate			9.37% - 13.12%

Notes:
(1) From Schedule 17 of the Staff Report.
(2) From Schedule 15, column 4 of the Staff Report, supplemented with the 4.0% 5-year EPS growth rate for Connecticut Water Service, Inc. and the 6.0% 5-year EPS grwoth rate for York Water Co. from The Value Line Investment Survey, July 22, 2011.
(3) Column 3 + Column 4.

Ibbotson® SBBI®
2011 Valuation Yearbook

Market Results for Stocks, Bonds, Bills, and Inflation 1926–2010

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Chapter 5

The Equity Risk Premium

The expected equity risk premium can be defined as the additional return an investor expects to receive to compensate for the additional risk associated with investing in equities as opposed to investing in riskless assets. It is an essential component in several cost of equity estimation models, including the buildup method, the capital asset pricing model (CAPM), and the Fama-French three factor model. It is important to note that the expected equity risk premium, as it is used in discount rates and cost of capital analysis, is a forward-looking concept. That is, the equity risk premium that is used in the discount rate should be reflective of what investors think the risk premium will be going forward.

Unfortunately, the expected equity risk premium is unobservable in the market and therefore must be estimated. Typically, this estimation is arrived at through the use of historical data. The historical equity risk premium can be calculated by subtracting the long-term average of the income return on the riskless asset (Treasuries) from the long-term average stock market return (measured over the same period as that of the riskless asset). In using a historical measure of the equity risk premium, one assumes that what has happened in the past is representative of what might be expected in the future. In other words, the assumption one makes when using historical data to measure the expected equity risk premium is that the relationship between the returns of the risky asset (equities) and the riskless asset (Treasuries) is stable. The stability of this relationship will be examined later in this chapter.

Since the expected equity risk premium must be estimated, there is much controversy regarding how the estimation should be conducted. A variety of different approaches to calculating the equity risk premium have been utilized over the years. Such studies can be categorized into four groups based on the approaches they have taken. The first group of studies tries to derive the equity risk premium from historical returns between stocks and bonds as was mentioned above. The second group, embracing a supply side model, uses fundamental information such as earnings, dividends, or overall economic productivity to measure the expected equity risk premium. A third group adopts demand side models that derive the expected returns of equities through the payoff demanded by investors for bearing the risk of equity investments.[1] The opinions of financial professionals through broad surveys are relied upon by the fourth and final group.

The range of equity risk premium estimates used in practice is surprisingly large. Using a low equity risk premium estimate as opposed to a high estimate can have a significant impact on the estimated value of a stream of cash flows. This chapter addresses many of the controversies surrounding estimation of the equity risk premium and focuses primarily on the historical calculation but also discusses the supply side model.

Calculating the Historical Equity Risk Premium

In measuring the historical equity risk premium one must make a number of decisions that can impact the resulting figure; some decisions have a greater impact than others. These decisions include selecting the stock market benchmark, the risk-free asset, either an arithmetic or a geometric average, and the time period for measurement. Each of these factors has an impact on the resulting equity risk premium estimate.

The Stock Market Benchmark

The stock market benchmark chosen should be a broad index that reflects the behavior of the market as a whole. Two examples of commonly used indexes are the S&P 500® and the New York Stock Exchange Composite Index. Although the Dow Jones Industrial Average is a popular index, it would be inappropriate for calculating the equity risk premium because it is too narrow.

We use the total return of our large company stock index (currently represented by the S&P 500) as our market benchmark when calculating the equity risk premium. The S&P 500 was selected as the appropriate market benchmark because it is representative of a large sample of companies across a large number of industries. As of December 31, 1993, 88 separate industry groups were included in the index, and the industry composition of the index has not changed since. The S&P 500 is also one of the most widely accepted market benchmarks. In short, the S&P 500 is a good measure of the equity market as a whole. Table 5-1 illustrates the equity risk premium calculation using several different market indices and the income return on three government bonds of different horizons.

Table 5-1: Equity Risk Premium with Different Market Indices

	Equity Risk Premia		
	Long-Horizon (%)	Intermediate-Horizon (%)	Short-Horizon (%)
S&P 500	6.72	7.22	8.22
Total Value-Weighted NYSE	6.52	7.03	8.02
NYSE Deciles 1–2	5.99	6.50	7.49

Data from 1926–2010.

The equity risk premium is calculated by subtracting the arithmetic mean of the government bond income return from the arithmetic mean of the stock market total return. Table 5-2 demonstrates this calculation for the long-horizon equity risk premium.

Table 5-2: Long-Horizon Equity Risk Premium Calculation

	Arithmetic Mean				
Long-Horizon	Market Total Return (%)		Risk-Free Rate (%)		Equity Risk Premium (%)
S&P 500	11.88	–	5.17	=	6.72*
Total Value-Weighted NYSE	11.69	–	5.17	=	6.52
NYSE Deciles 1–2	11.15	–	5.17	=	5.99*

Data from 1926–2010. *difference due to rounding.

Data for the New York Stock Exchange is obtained from Morningstar and the Center for Research in Security Prices (CRSP) at the University of Chicago's Graduate School of Business. The "Total" series is a capitalization-weighted index and includes all stocks traded on the New York Stock Exchange except closed-end mutual funds, real estate investment trusts, foreign stocks, and Americus Trusts. Capitalization-weighted means that the weight of each stock in the index, for a given month, is proportionate to its market capitalization (price times number of shares outstanding) at the beginning of that month. The "Decile 1–2" series includes all stocks with capitalizations that rank within the upper 20 percent of companies traded on the New York Stock Exchange, and it is therefore a large-capitalization index. For more information on the Center for Research in Security Pricing data methodology, see Chapter 7.

The resulting equity risk premia vary somewhat depending on the market index chosen. It is expected that using the "Total" series will result in a higher equity risk premium than using the "Decile 1–2" series, since the "Decile 1–2" series is a large-capitalization series. As of September 30, 2010, deciles 1–2 of the New York Stock Exchange contained the largest 274 companies traded on the exchange. The "Total" series includes smaller companies that have had historically higher returns, resulting in a higher equity risk premium.

The higher equity risk premium arrived at by using the S&P 500 as a market benchmark is more difficult to explain. One possible explanation is that the S&P 500 is not restricted to the largest 500 companies; other considerations such as industry composition are taken into account when determining if a company should be included in the index. Some smaller stocks are thus included, which may result in the higher equity risk premium of the index. Another possible explanation would be what is termed the "S&P inclusion effect." It is thought that simply being included among the stocks listed on the S&P 500 augments a company's returns. This is due to the large quantity of institutional funds that flow into companies that are listed in the index.

Comparing the S&P 500 total returns to those of another large-capitalization stock index may help evaluate the potential impact of the "S&P inclusion effect." Prior to March 1957, the S&P index that is used throughout this publication consisted of 90 of the largest stocks. The index composition was then changed to include 500 large-capitalization stocks that, as stated earlier, are not necessarily the 500 largest. Deciles 1–2 of the NYSE contained just over 200 of the largest companies, ranked by market capitalization, in March of 1957. The number of companies included in the deciles of the NYSE fluctuates from quarter to quarter, and by September of 2010, deciles 1–2 contained 274 companies. Though one cannot draw a causal relationship between the change in construction and the correlation of these two indices, this analysis does indicate that the "S&P inclusion effect" does not appear to be very significant in recent periods.

Another possible explanation could be differences in how survivorship is treated when calculating returns. The Center for Research in Security Prices includes the return for a company in the average decile return for the period following the company's removal from the decile, whether caused by a shift to a different decile portfolio, bankruptcy, or other such reason. On the other hand, the S&P 500 does not make this adjustment. Once a company is no longer included among the S&P 500, its return is dropped from the index. However, this effect may be lessened by the advance announcement of companies being dropped from or added to the S&P 500. In many instances throughout this publication we will present equity risk premia using both the S&P 500 and the NYSE "Deciles 1–2" portfolio to provide a comparison between these large-capitalization benchmarks.

The Market Benchmark and Firm Size

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

The Risk-Free Asset

The equity risk premium can be calculated for a variety of time horizons when given the choice of risk-free asset to be used in the calculation. The *2011 Ibbotson® Stocks, Bonds, Bills, and Inflation® Classic Yearbook* provides equity risk premia calculations for short-, intermediate-, and long-term horizons. The short-, intermediate-, and long-horizon equity risk premia are calculated using the income return from a 30-day Treasury bill, a 5-year Treasury bond, and a 20-year Treasury bond, respectively.

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

20-Year versus 30-Year Treasuries

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

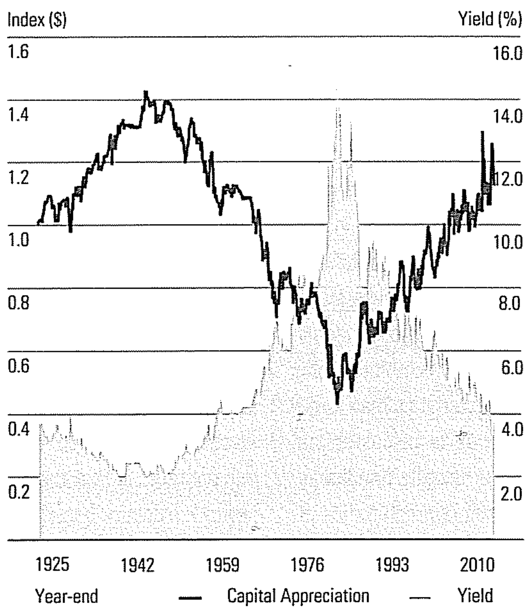
The same reason exists for why we do not use the 10-year Treasury bond—a long history of market data is not available for 10-year bonds. We have persisted in using a 20-year bond to keep the basis of the time series consistent.

Income Return

Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return. The income return is defined as the portion of the total return that results from a periodic cash flow or, in this case, the bond coupon payment. The capital appreciation return results from the price change of a bond over a specific period. Bond prices generally change in reaction to unexpected fluctuations in yields. Reinvestment return is the return on a given month's investment income when reinvested into the same asset class in the subsequent months of the year. The income return is thus used in the estimation of the equity risk premium because it represents the truly riskless portion of the return.[2]

Yields have generally risen on the long-term bond over the 1926–2010 period, so it has experienced negative capital appreciation over much of this time. This trend has turned around since the 1980s, however. Graph 5-1 illustrates the yields on the long-term government bond series compared to an index of the long-term government bond capital appreciation. In general, as yields rose, the capital appreciation index fell, and vice versa. Had an investor held the long-term bond to maturity, he would have realized the yield on the bond as the total return. However, in a constant maturity portfolio, such as those used to measure bond returns in this publication, bonds are sold before maturity (at a capital loss if the market yield has risen since the time of purchase). This negative return is associated with the risk of unanticipated yield changes.

Graph 5-1: Long-term Government Bond Yields versus Capital Appreciation Index



Data from 1925–2010.

For example, if bond yields rise unexpectedly, investors can receive a higher coupon payment from a newly issued bond than from the purchase of an outstanding bond with the former lower-coupon payment. The outstanding lower-coupon bond will thus fail to attract buyers, and its price will decrease, causing its yield to increase correspondingly, as its coupon payment remains the same. The newly priced outstanding bond will subsequently attract purchasers who will benefit from the shift in price and yield; however, those investors who already held the bond will suffer a capital loss due to the fall in price.

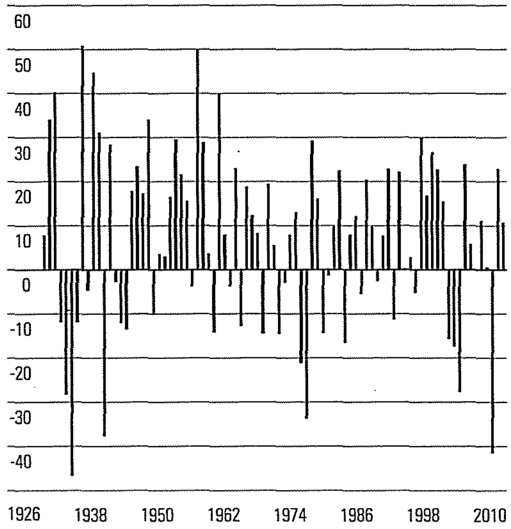
Anticipated changes in yields are assessed by the market and figured into the price of a bond. Future changes in yields that are not anticipated will cause the price of the bond to adjust accordingly. Price changes in bonds due to unanticipated changes in yields introduce price risk into the total return. Therefore, the total return on the bond series does not represent the riskless rate of return.The income return better represents the unbiased estimate of the purely riskless rate of return, since an investor can hold a bond to maturity and be entitled to the income return with no capital loss.

Arithmetic versus Geometric Means

The equity risk premium data presented in this book are arithmetic average risk premia as opposed to geometric average risk premia. The arithmetic average equity risk premium can be demonstrated to be most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the building block approach, the arithmetic mean or the simple difference of the arithmetic means of stock market returns and riskless rates is the relevant number. This is because both the CAPM and the building block approach are additive models, in which the cost of capital is the sum of its parts. The geometric average is more appropriate for reporting past performance, since it represents the compound average return.

The argument for using the arithmetic average is quite straightforward. In looking at projected cash flows, the equity risk premium that should be employed is the equity risk premium that is expected to actually be incurred over the future time periods. Graph 5-2 shows the realized equity risk premium for each year based on the returns of the S&P 500 and the income return on long-term government bonds. (The actual, observed difference between the return on the stock market and the riskless rate is known as the realized equity risk premium.) There is considerable volatility in the year-by-year statistics. At times the realized equity risk premium is even negative.

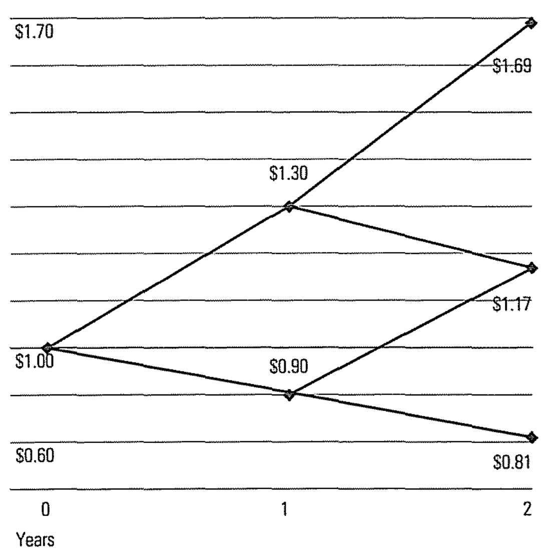
Graph 5-2: Realized Equity Risk Premium Per Year



Data from 1926–2010.

To illustrate how the arithmetic mean is more appropriate than the geometric mean in discounting cash flows, suppose the expected return on a stock is 10 percent per year with a standard deviation of 20 percent. Also assume that only two outcomes are possible each year: +30 percent and −10 percent (i.e., the mean plus or minus one standard deviation). The probability of occurrence for each outcome is equal. The growth of wealth over a two-year period is illustrated in Graph 5-3.

Graph 5-3: Growth of Wealth Example



The most common outcome of $1.17 is given by the geometric mean of 8.2 percent. Compounding the possible outcomes as follows derives the geometric mean:

$$\left[(1+0.30)\times(1-0.10)\right]^{1/2}-1=0.082$$

However, the expected value is predicted by compounding the arithmetic, not the geometric, mean. To illustrate this, we need to look at the probability-weighted average of all possible outcomes:

(0.25 × $1.69) =	$0.4225
+ (0.50 × $1.17) =	$0.5850
+ (0.25 × $0.81) =	$0.2025
Total	$1.2100

Therefore, $1.21 is the probability-weighted expected value. The rate that must be compounded to achieve the terminal value of $1.21 after 2 years is 10 percent, the arithmetic mean:

$$\$1\times(1+0.10)^2=\$1.21$$

The geometric mean, when compounded, results in the median of the distribution:

$$\$1\times(1+0.082)^2=\$1.17$$

The arithmetic mean equates the expected future value with the present value; it is therefore the appropriate discount rate.

Appropriate Historical Time Period

The equity risk premium can be estimated using any historical time period. For the U.S., market data exists at least as far back as the late 1800s. Therefore, it is possible to estimate the equity risk premium using data that covers roughly the past 100 years.

Our equity risk premium covers the time period from 1926 to the present. The original data source for the time series comprising the equity risk premium is the Center for Research in Security Prices. CRSP chose to begin their analysis of market returns with 1926 for two main reasons. CRSP determined that the time period around 1926 was approximately when quality financial data became available. They also made a conscious effort to include the period of extreme market volatility from the late twenties and early thirties; 1926 was chosen because it includes one full business cycle of data before the market crash of 1929. These are the most basic reasons why our equity risk premium calculation window starts in 1926.

Implicit in using history to forecast the future is the assumption that investors' expectations for future outcomes conform to past results. This method assumes that the price of taking on risk changes only slowly, if at all, over time. This "future equals the past" assumption is most applicable to a random time-series variable. A time-series variable is random if its value in one period is independent of its value in other periods.

Does the Equity Risk Premium Revert to Its Mean Over Time?

Some have argued that the estimate of the equity risk premium is upwardly biased since the stock market is currently priced high. In other words, since there have been several years with extraordinarily high market returns and realized equity risk premia, the expectation is that returns and realized equity risk premia will be lower in the future, bringing the average back to a normalized level. This argument relies on several studies that have tried to determine whether reversion to the mean exists in stock market prices and the equity risk premium.[3] Several academics contradict each other on this topic; moreover, the evidence supporting this argument is neither conclusive nor compelling enough to make such a strong assumption.

Our own empirical evidence suggests that the yearly difference between the stock market total return and the U.S. Treasury bond income return in any particular year is random. Graph 5-2, presented earlier, illustrates the randomness of the realized equity risk premium.

A statistical measure of the randomness of a return series is its serial correlation. Serial correlation (or autocorrelation) is defined as the degree to which the return of a given series is related from period to period. A serial correlation near positive one indicates that returns are predictable from one period to the next period and are positively related. That is, the returns of one period are a good predictor of the returns in the next period. Conversely, a serial correlation near negative one indicates that the returns in one period are inversely related to those of the next period. A serial correlation near zero indicates that the returns are random or unpredictable from one period to the next. Table 5-3 contains the serial correlation of the market total returns, the realized long-horizon equity risk premium, and inflation.

Table 5-3: Interpretation of Annual Serial Correlations

Series	Serial Correlation	Interpretation
Large Company Stock Total Returns	0.02	Random
Equity Risk Premium	0.02	Random
Inflation Rates	0.64	Trend

Data from 1926–2010.

The significance of this evidence is that the realized equity risk premium next year will not be dependent on the realized equity risk premium from this year. That is, there is no discernable pattern in the realized equity risk premium—it is virtually impossible to forecast next year's realized risk premium based on the premium of the previous year. For example, if this year's difference between the riskless rate and the return on the stock market is higher than last year's, that does not imply that next year's will be higher than this year's. It is as likely to be higher as it is lower. The best estimate of the expected value of a variable that has behaved randomly in the past is the average (or arithmetic mean) of its past values.

Table 5-4 also indicates that the equity risk premium varies considerably by decade. The complete decades ranged from a high of 17.9 percent in the 1950s to a low of -3.7 percent in the 2000s. This look at historical equity risk premium reveals no observable pattern.

Table 5-4: Long-Horizon Equity Risk Premium by Decade (%)

1920s*	1930s	1940s	1950s	1960s	1970s	1980s	1990s	2000s	2001-2010
17.6	2.3	8.0	17.9	4.2	0.3	7.9	12.1	-3.7	-1.1

Data from 1926–2010.
*Based on the period 1926–1929.

Finnerty and Leistikow perform more econometrically sophisticated tests of mean reversion in the equity risk premium. Their tests demonstrate that—as we suspected from our simpler tests—the equity risk premium that was realized over 1926 to the present was almost perfectly free of mean reversion and had no statistically identifiable time trends.[4] Lo and MacKinlay conclude, "the rejection of the random walk for weekly returns does not support a mean-reverting model of asset prices."

Choosing an Appropriate Historical Period

The estimate of the equity risk premium depends on the length of the data series studied. A proper estimate of the equity risk premium requires a data series long enough to give a reliable average without being unduly influenced by very good and very poor short-term returns. When calculated using a long data series, the historical equity risk premium is relatively stable.[5] Furthermore, because an average of the realized equity risk premium is quite volatile when calculated using a short history, using a long series makes it less likely that the analyst can justify any number he or she wants. The magnitude of how shorter periods can affect the result will be explored later in this chapter.

Some analysts estimate the expected equity risk premium using a shorter, more recent time period on the basis that recent events are more likely to be repeated in the near future; furthermore, they believe that the 1920s, 1930s, and 1940s contain too many unusual events. This view is suspect because all periods contain "unusual" events. Some of the most unusual events of the last hundred years took place quite recently, including the inflation of the late 1970s and early 1980s, the October 1987 stock market crash, the collapse of the high-yield bond market, the major contraction and consolidation of the thrift industry, the collapse of the Soviet Union, the development of the European Economic Community, the attacks of September 11, 2001 and the more recent liquidity crisis of 2008 and 2009.

It is even difficult for economists to predict the economic environment of the future. For example, if one were analyzing the stock market in 1987 before the crash, it would be statistically improbable to predict the impending short-term volatility without considering the stock market crash and market volatility of the 1929–1931 period.

Without an appreciation of the 1920s and 1930s, no one would believe that such events could happen. The 85-year period starting with 1926 is representative of what can happen: it includes high and low returns, volatile and quiet markets, war and peace, inflation and deflation, and prosperity and depression. Restricting attention to a shorter historical period underestimates the amount of change that could occur in a long future period. Finally, because historical event-types (not specific events) tend to repeat themselves, long-run capital market return studies can reveal a great deal about the future. Investors probably expect "unusual" events to occur from time to time, and their return expectations reflect this.

A Look at the Historical Results

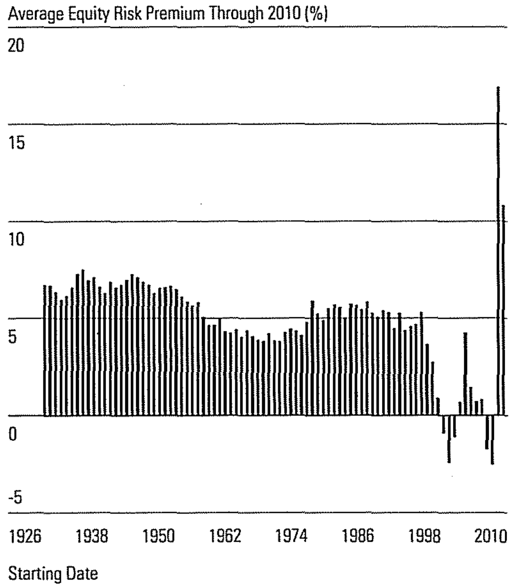
It is interesting to take a look at the realized returns and realized equity risk premium in the context of the above discussion. Table 5-5 shows the average stock market return and the average (arithmetic mean) realized long-horizon equity risk premium over various historical time periods. Similarly, Graph 5-5 shows the average (arithmetic mean) realized equity risk premium calculated through 2010 for different ending dates. The table and the graph both show that using a longer historical period provides a more stable estimate of the equity risk premium. The reason is that any unique period will not be weighted heavily in an average covering a longer historical period. It better represents the probability of these unique events occurring over a long period of time.

Table 5-5: Stock Market Return and Equity Risk Premium Over Time

Length (Yrs.)	Period Dates	Large Company Stock Arithmetic Mean Total Return (%)	Long-Horizon Equity Risk Premium (%)
85	1926–2010	11.8	6.7
70	1941–2010	12.6	7.0
60	1951–2010	12.3	6.1
50	1961–2010	11.2	4.4
40	1971–2010	11.8	4.5
30	1981–2010	12.2	5.0
20	1991–2010	11.0	5.3
15	1996–2010	8.9	3.7
10	2001–2010	3.6	-1.1
5	2006–2010	5.2	0.8

Data from 1926–2010.

Graph 5-4: Equity Risk Premium Using Different Starting Dates



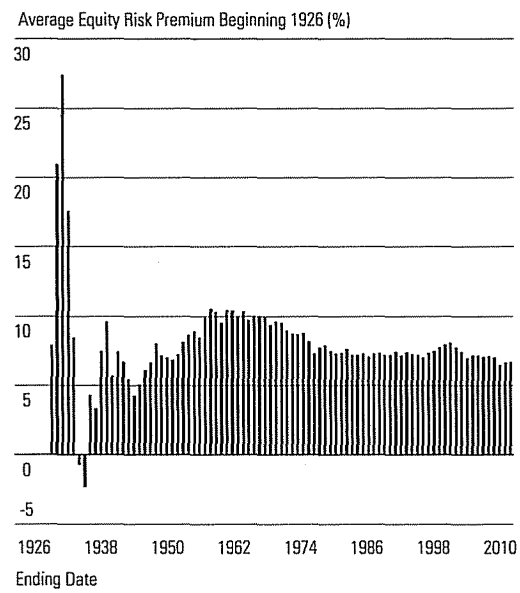
Data from 1926–2010.

Looking carefully at Graph 5-4 will clarify this point. The graph shows the realized equity risk premium for a series of time periods through 2010, starting with 1926. In other words, the first value on the graph represents the average realized equity risk premium over the period 1926–2010. The next value on the graph represents the average realized equity risk premium over the period 1927–2010, and so on, with the last value representing the average over the most recent five years, 2006–2010. Concentrating on the left side of Graph 5-5, one notices that the realized equity risk premium, when measured over long periods of time, is relatively stable. In viewing the graph from left to right, moving from longer to shorter historical periods, one sees that the value of the realized equity risk premium begins to decline significantly. Why does this occur? The reason is that the severe bear market of 1973–1974 is receiving proportionately more weight in the shorter, more recent average. If you continue to follow the line to the right, however, you will also notice that when 1973 and 1974 fall out of the recent average, the realized equity risk premium jumps up by nearly 1.2 percent.

Additionally, use of recent historical periods for estimation purposes can lead to illogical conclusions. As seen in Table 5-5, the bear market in the early 2000's and in 2008 has caused the realized equity risk premium in the shorter historical periods to be lower than the long-term average.

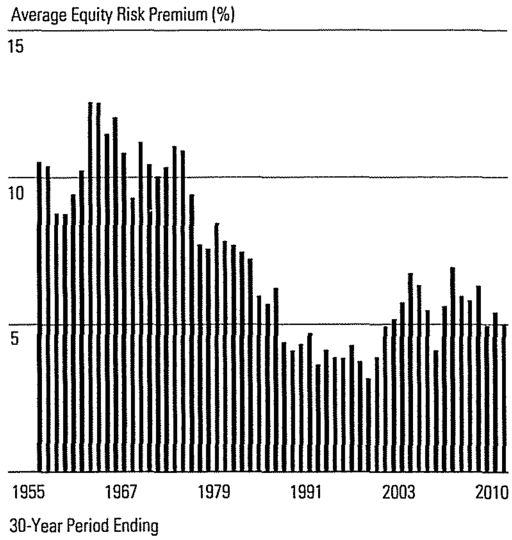
The impact of adding one additional year of data to a historical average is lessened the greater the initial time period of measurement. Short-term averages can be affected considerably by one or more unique observations. On the other hand, long-term averages produce more stable results. A series of graphs looking at the realized equity risk premium will illustrate this effect. Graph 5-5 shows the average (arithmetic mean) realized long-horizon equity risk premium starting in 1926. Each additional point on the graph represents the addition of another year to the average. Although the graph is extremely volatile in the beginning periods, the stability of the long-term average is quite remarkable. Again, the "unique" periods of time will not be weighted heavily in a long-term average, resulting in a more stable estimate.

Graph 5-5: Equity Risk Premium Using Different Ending Dates



Data from 1926–2010.

Graph 5-6: Equity Risk Premium Over 30-Year Periods



Data from 1926–2010.

Some practitioners argue for a shorter historical time period, such as 30 years, as a basis for the equity risk premium estimation. The logic for the use of a shorter period is that historical events and economic scenarios present before this time are unlikely to be repeated. Graph 5-6 shows the equity risk premium measured over 30-year periods, and it appears from the graph that the premium has been trending downwards. The 30-year equity risk premium remained close to 4 percent for several years in the 1980s and 1990s. However, it has fallen and then risen in the most recent 30-year periods.

The key to understanding this result lies again in the years 1973 and 1974. The oil embargo during this period had a tremendous effect on the market. The equity risk premium for these years alone was -21 and -34 percent, respectively. Periods that include the years 1973 and 1974 result in an average equity risk premium as low as 3.1 percent. In the most recent 30-year periods that excludes 1973 and 1974, the average rises to over 6 percent. The 2000s have also had an enormous effect on the equity risk premium.

It is difficult to justify such a large divergence in estimates of return over such a short period of time. This does not suggest, however, that the years 1973 and 1974 should be excluded from any estimate of the equity risk premium; rather, it emphasizes the importance of using a long historical period when measuring the equity risk premium in order to obtain a reliable average that is not overly influenced by short-term returns. The same holds true when analyzing the poor performance of the early 2000s and 2008.

Does the Equity Risk Premium Represent Minority or Controlling Interest?

There is quite a bit of confusion among valuation practitioners regarding the use of publicly traded company data to derive the equity risk premium. Is a minority discount implicit in this data? Recall that the equity risk premium is typically derived from the returns of a market index: the S&P 500, the New York Stock Exchange (NYSE), or the NYSE Deciles 1–2. (The size premia that are covered in Chapter 7 are derived from the returns of companies traded on the NYSE, in addition to those on the NYSE AMEX and NASDAQ). Both the S&P 500 and the NYSE include a preponderance of companies that are minority held. Does this imply that an equity risk premium (or size premium) derived from these data represents a minority interest premium? This is a critical issue that must be addressed by the valuation professional, since applying a minority discount or a control premium can have a material impact on the ultimate value derived in an appraisal.

Since most companies in the S&P 500 and the NYSE are minority held, some assume that the risk premia derived from these return data represent minority returns and therefore have a minority discount implicit within them. However, this assumption is not correct. The returns that are generated by the S&P 500 and the NYSE represent returns to equity holders. While most of these companies are minority held, there is no evidence that higher rates of return could be earned if these companies were suddenly acquired by majority shareholders. The equity risk premium represents expected premiums that holders of securities of a similar nature can expect to achieve on average into the future. There is no distinction between minority owners and controlling owners.

The discount rate is meant to represent the underlying risk of being in a particular industry or line of business. There are instances when a majority shareholder can acquire a company and improve the cash flows generated by that company. However, this does not necessarily have an impact on the general risk level of the cash flows generated by the company.

When performing discounted cash flow analysis, adjustments for minority or controlling interest value may be more suitably made to the projected cash flows than to the discount rate. Adjusting the expected future cash flows better measures the potential impact a controlling party may have while not overstating or understating the actual risk associated with a particular line of business.

Appraisers need to note the distinction between a publicly traded value and a minority interest value. Most public companies have no majority or controlling owner. There is thus no distinction between owners in this setting. One cannot assume that publicly held companies with no controlling owner have the same characteristics as privately held companies with both a controlling interest owner and a minority interest owner.

Other Equity Risk Premium Issues

There are a number of other issues that are commonly brought up regarding the equity risk premium that, if correct, would reduce its size. These issues include:

1. Survivorship bias in the measurement of the equity risk premium
2. Utility theory models of estimating the equity risk premium
3. Reconciling the discounted cash flow approach to the equity risk premium
4. Over-valuation effects of the market
5. Changes in investor attitudes toward market conditions
6. Supply side models of estimating the equity risk premium

In this section, we will examine each of these issues.

Survivorship

One common problem in working with financial data is properly accounting for survivorship. In working with company-specific historical data, it is important for researchers to include data from companies that failed as well as companies that succeeded before drawing conclusions from elements of that data.

The same argument can be made regarding markets as a whole. The equity risk premium data outlined in this book represent data on the United States stock market. The United States has arguably been the most successful stock market of the twentieth century. That being the case, might equity risk premium statistics based only on U.S. data overstate the returns of equities as a whole because they only focus on one successful market?

In a recent paper, Goetzmann and Jorion study this question by looking at returns from a number of world equity markets over the past century.[6] The Goetzmann-Jorion paper looks at the survivorship bias from several different perspectives. They conclude that once survivorship is taken into consideration the U.S. equity risk premium is overstated by approximately 60 basis points.[7] The non-U.S. equity risk premium was found to contain significantly more survivorship bias.

While the survivorship bias evidence may be compelling on a worldwide basis, one can question its relevance to a purely U.S. analysis. If the entity being valued is a U.S. company, then the relevant data set should be the performance of equities in the U.S. market.

Equity Risk Premium Puzzle

In 1985, Mehra and Prescott published a paper that discussed the equity risk premium from a utility theory perspective. The point that Mehra and Prescott make is that under existing economic theory, economists cannot justify the magnitude of the equity risk premium. The utility theory model employed was incapable of obtaining values consistent with those observed in the market.

This is an interesting point and may be worthy of further study, but it does not do anything to prove that the equity risk premium is too high. It may, on the other hand, indicate that theoretical economic models require further refinement to adequately explain market behavior.

Discounted Cash Flow versus Capital Asset Pricing Model

Two of the most commonly used cost of equity models are the discounted cash flow model and the capital asset pricing model. We should be able to reconcile the two models. In its basic form, the discounted cash flow model states that the expected return on equities is the dividend yield plus the expected long-term growth rate. The capital asset pricing model states that the expected return on equities is the risk-free rate plus the equity risk premium.[8]

For the discounted cash flow model we can obtain an estimate of the long-term growth rate for the entire economy by looking at its component parts. Real Gross Domestic Product growth has averaged approximately three percent over long periods of time. Long-term expected inflation is currently in the range of one percent. Combining these two numbers produces an expected long-term growth rate of about four percent. Dividend yields have been between two percent and three percent historically. The discounted cash flow expected equity return is thus between six percent and seven percent using these assumptions.

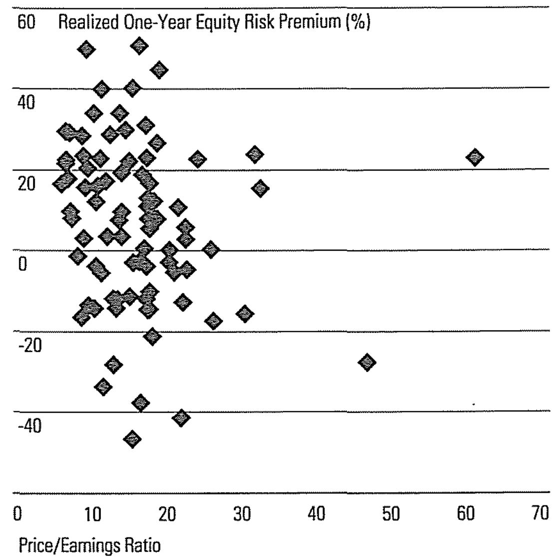
If we try to reconcile this expected equity return with that found using the capital asset pricing model, we find a significant discrepancy. The yield on government bonds has been about three percent. If the two models are to reconcile, the equity risk premium must be in the three to four percent range instead of the seven to eight percent range we have observed historically.

It is not easy to explain why these two models are so difficult to reconcile. While it is possible to modify the assumptions slightly, doing so still does not produce the desired results. One explanation might be that one or both of the models are too simplistic and therefore lack the ability to resolve this inconsistency.

Market Bubbles

Another criticism of using the historical equity risk premium is that the market is overvalued. This argument is often offered after stock prices have seen a sustained increase. The logic of the argument is that abnormally high market returns drive the historical equity risk premium higher while at the same time driving the expected equity risk premium lower. As evidence of the market being overvalued, one can look at the price/earnings multiple of the market. Graph 5-7 attempts to demonstrate the relationship between the price/earnings multiple and the subsequent period's equity risk premium. If the above argument held, one would expect to find a low equity risk premium associated with a high price/earnings multiple from the prior period. One would also expect a high equity risk premium to be associated with a low price/earnings multiple in the prior period. From the graph there does not seem to be a clear indication of the market being overvalued or undervalued with respect to the next period's realized equity risk premium.

Graph 5-7: Price-Earnings Multiple versus Subsequent Year's Realized Equity Risk Premium



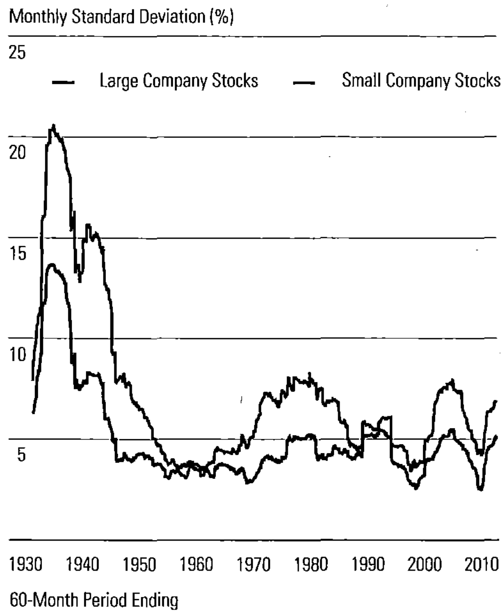
Data from 1926–2010. Source: Historical price/earnings ratios from Standard & Poor's Security Price Index Record and Compustat database.

There are yet other problems with this theory. First, the equity risk premium is measured over a long historical time period. Several years of strong market returns have a relatively small impact on the ultimate equity risk premium estimate. Second, we are attempting to forecast a long-term equity risk premium. Even if the market were to underperform over several consecutive time periods, this should not have a significant impact on expected long-term returns. Finally, one ratio does not necessarily tell the whole story. The price/earnings ratio shows the current stock price divided by the historical earnings per share. Stock prices should, on the other hand, incorporate expectations of future earnings growth. A high market price/earnings ratio may indicate that investors expect significant future earnings growth.

Change in Investor Attitudes

There is no law that states that investor attitudes must remain constant over time. With the advent of 401(k) investing and the increase in education of the investing public, the market may have changed. In fact, stock returns have become less volatile over time. Graph 5-8 demonstrates a relative decline in the rolling 60-month standard deviation of both large and small stocks. (Standard deviation is a measure of the returns' volatility or risk.) This may suggest that we have moved into a new market regime in which stocks are less volatile and therefore require a lower risk premium than in the past.[9]

Graph 5-8: Rolling 60-Month Standard Deviation for Large and Small Stocks



Data from January 1926–December 2010.

There are two arguments against this rationale. First, it could easily be argued that we have moved through a series of market regimes during the 85-year history of the equity risk premium calculation window used in this book. Given that markets and investor attitudes have changed over time and the equity risk premium has remained relatively constant, there is no reason to believe that a new market regime will have any greater or lesser impact than any other time period.

A second argument relates to the demand for investments. If investors are more comfortable with the market and with stock investing, they will probably place more money into the market. This influx of funds will increase the demand for stocks, which will ultimately increase, not decrease, the equity risk premium.

Supply Model

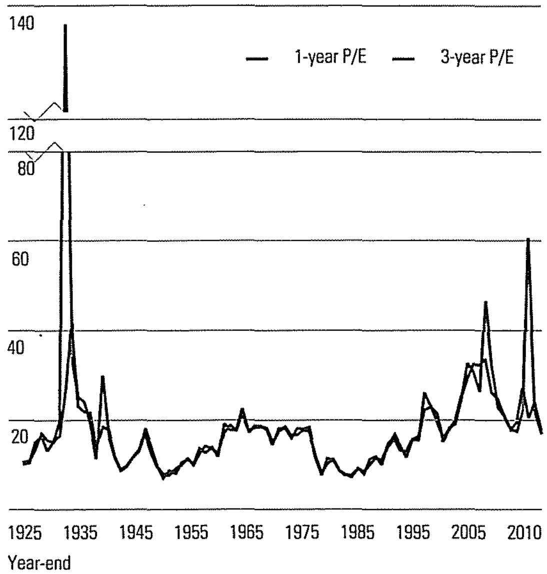
Long-term expected equity returns can be forecasted by the use of supply side models. The supply of stock market returns is generated by the productivity of the corporations in the real economy. Investors should not expect a much higher or lower return than that produced by the companies in the real economy. Thus, over the long run, equity returns should be close to the long-run supply estimate.

Roger G. Ibbotson and Peng Chen forecast the equity risk premium through a supply side model using historical data.[10] They utilized an earnings model as the basis for their supply side estimate; historically, the growth in corporate earnings has been in line with the growth of overall economic productivity. The earnings model breaks historical returns into four pieces, with only three historically being supplied by companies: inflation, income return, and growth in real earnings per share. The growth in the P/E ratio, the fourth piece, is a reflection of investors' changing prediction of future earnings growth. The past supply of corporate growth is forecasted to continue; however, a change in investors' predictions is not. P/E rose dramatically from 1980 through 2001 because people believed that corporate earnings were going to grow faster in the future. This growth of P/E drove a small portion of the rise in equity returns over the same period.

Graph 5-9 illustrates the price to earnings ratio calculated using one-year and three-year average earnings from 1926 to 2010. The P/E ratio, using one-year average earnings, was 10.22 at the beginning of 1926 and ended the year 2010 at 16.79—an average increase of 0.59 percent per year. The highest P/E was 136.55 recorded in 1932, while the lowest was 25.06 recorded in 1948.

Ibbotson Associates revised the calculation of the P/E ratio from a one-year to a three-year average earnings for use in equity forecasting. This is because reported earnings are affected not only by the long-term productivity, but also by "one-time" items that do not necessarily have the same consistent impact year after year. The three-year average is more reflective of the long-term trend than the year-by-year numbers. The P/E ratio calculated using the three-year average of earnings had an increase of 1.66 percent per year.

Graph 5-9: Large Company Stocks



The historical P/E growth factor using three-year earnings of 1.66 percent per year is subtracted from the forecast because it is not believed that P/E will continue to increase in the future. The market serves as the cue. The current P/E ratio is the market's best guess for the future of corporate earnings and there is no reason to believe, at this time, that the market will change its mind.

Thus, the supply of equity returns only includes inflation, the growth in real earnings per share, and income return:

$$SR = \left[\left(1+CPI\right)\times\left(1+g_{REPS}\right)-1\right]+Inc+Rinv$$

$$9.24\%^{*} = \left[\left(1+2.99\%\right)\times\left(1+1.88\%\right)-1\right]+4.11\%+0.21\%$$

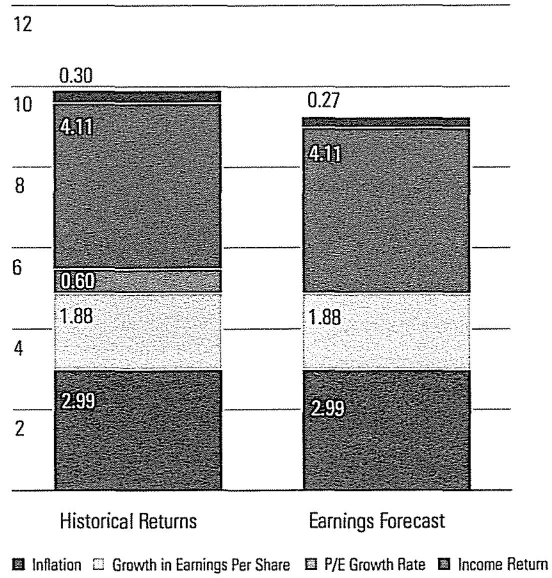
*difference due to rounding

where:

SR = the supply of the equity return;
CPI = Consumer Price Index (inflation);
g_{REPS} = the growth in real earning per share;
Inc = the income return;
Rinv = the reinvestment return.

The forward-looking earnings model calculates the long-term supply of U.S. equity returns to be 9.24 percent.

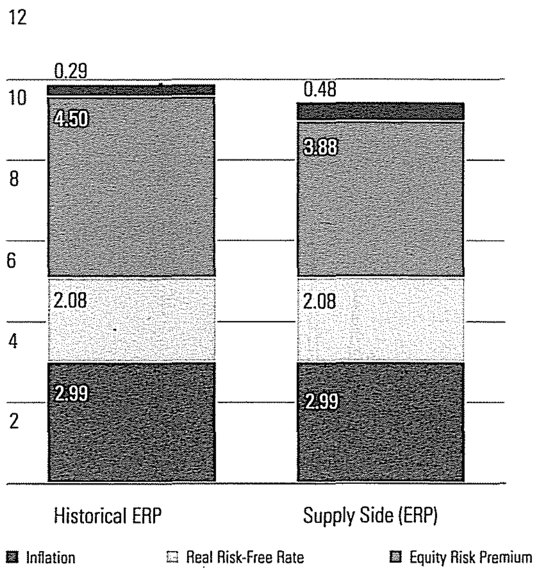
Graph 5-10: Historical and Forecast Equity Returns Based on Earnings Model



Data from 1926–2010. Results add up geometrically, not arithmetically. The darkest shade in the graph represents reinvested returns and an interaction factor between the return components.

Graph 5-10 illustrates the decomposition of historical equity returns from 1926–2010. It also illustrates the historical components that are supplied by companies: inflation, income return, and growth in real earnings per share. Once again the main difference between the historical and forecast equity returns is the exclusion of growth in P/E ratio in the forecasted earnings model.

Graph 5-11: Historical and Forecast Equity Risk Premium



Data from 1926–2010. Results add up geometrically, not arithmetically. The darkest shade in the graph represents reinvested returns and an interaction factor between the return components.

Table 5-6: Supply Side and Historical Equity Risk Premium Over Time

Period Length (Yrs.)	Period Dates	g(P/E)	Arithmetic Average Supply Side Equity Risk Premium (%)	Historical Equity Risk Premium (%)
85	1926–2010	0.60	5.96	6.72
84	1926–2009	0.96	5.55	6.67
83	1926–2008	0.79	5.53	6.47
82	1926–2007	1.15	5.74	7.06
81	1926–2006	0.75	6.22	7.13
80	1926–2005	0.65	6.29	7.08
79	1926–2004	0.83	6.18	7.17
78	1926–2003	1.09	5.94	7.19
77	1926–2002	1.17	5.65	6.97
76	1926–2001	1.53	5.71	7.43
75	1926–2000	1.49	6.06	7.76
74	1926–1999	1.52	6.32	8.07
73	1926–1998	1.40	6.35	7.97
72	1926–1997	1.20	6.37	7.77
71	1926–1996	0.87	6.46	7.50
70	1926–1995	0.74	6.47	7.37
69	1926–1994	0.59	6.32	7.04
68	1926–1993	0.90	6.17	7.22
67	1926–1992	1.15	5.98	7.29
66	1926–1991	1.12	6.12	7.39
65	1926–1990	0.67	6.36	7.16
64	1926–1989	0.60	6.72	7.45
63	1926–1988	0.32	6.78	7.21
62	1926–1987	0.36	6.74	7.20

Data from 1926–2010.

The Supply Side equity risk premium is calculated to be 3.91 percent on a geometric basis.

$$SERP = \frac{(1+SR)}{(1+CPI)\times(1+RRf)} - 1$$

$$3.91\%^{*} = \frac{(1+9.24\%)}{(1+2.99\%)\times(1+2.08\%)} - 1$$

*difference due to rounding.

where:
SERP = the supply side equity risk premium;
SR = the supply of the equity return;
CPI = Consumer Price Index (inflation); and,
RRf = the real risk-free rate.

Graph 5-11 compares the historical equity risk premium, which includes the P/E ratio, to the supply side equity risk premium calculated from 1926 to 2010 on a geometric basis. Contrary to several recent studies on equity risk premium that declare the forward-looking equity risk premium to be close to zero, or even negative, Ibbotson and Chen have found the long-term supply of equity risk premium to be only slightly lower than the straight historical estimate.

The supply side equity risk premium calculated earlier is a geometric calculation. An arithmetic calculation, as mentioned earlier in the chapter, is most appropriate when discounting future cash flows. For use as the expected equity risk premium in either the CAPM or the buildup approach, the arithmetic calculation is the relevant number. There are several ways to convert the geometric average into an arithmetic average. One method is to assume the returns are independently lognormally distributed over time, where the arithmetic and geometric averages roughly follow the following relationship:

$$R_A = R_G + \frac{\sigma^2}{2}$$

$$5.99\% = 3.88\% + \frac{20.51\%^2}{2}$$

where:
R_A = the arithmetic average;
R_G = the geometric average;
σ = the standard deviation of equity returns.

As stated in IRS Ruling 59-60, although valuation is a forward-looking process, it must be based on facts available as of the required date of appraisal. Therefore, Ibbotson provides data critical to the valuation process as far back as 1926, such as the historical equity risk premium and size premium presented in Appendix A of this book. Similarly, Table 5-6 presents the supply side equity risk premium, on an arithmetic basis, beginning in 1926 and ending in each of the last 25 years.

As mentioned earlier, one of the key findings of the Ibbotson and Chen study is that P/E increases account for only a small portion of the total return of equity. The reason we present supply side equity risk premium going back only 25 years is because the P/E ratio rose dramatically over this time period, which caused the growth rate in the P/E ratio calculated from 1926 to be relatively high. The subtraction of the P/E growth factor from equity returns has been responsible for the downward adjustment in the supply side equity risk premium compared to the historical estimate. Beyond the last 25 years, the growth factor in the P/E ratio has not been dramatic enough to require an adjustment.

This section has briefly reviewed some of the more common arguments that seek to reduce the equity risk premium. While some of these theories are compelling in an academic framework, most do little to prove that the equity risk premium is too high. When examining these theories, it is important to remember that the equity risk premium data outlined in this book (both the historical and supply side estimates) are from actual market statistics over a long historical time period.

Taxes and Equity Risk Premium Calculations

All of the risk premium statistics included in this publication are derived from market returns earned by an investor. The investor receives dividends and realizes price appreciation after the corporation has paid its taxes. Therefore, it is implicit that the market return data represents returns after corporate taxes but before personal taxes.

When performing a discounted cash flow analysis, both the discount rate and the cash flows should be on the same tax basis. Most valuation settings rely on after-tax cash flows; the use of an after-tax discount rate would thus be appropriate in most cases. However, there are some instances (usually because of regulatory or legal statute reasons) in which it is necessary to calculate a pre-tax value. In these cases, a pre-tax cost of capital or discount rate should be employed. There is no easy way, however, to accurately modify the return on a market index to a pre-tax basis. This modification would require estimating pre-tax returns for all of the publicly traded companies that comprise the market benchmark.

This presents a problem when a pre-tax discounted cash flow analysis is required. Although not completely correct, the easiest way to convert an after-tax discount rate to a pre-tax discount rate is to divide the after-tax rate by (1 minus the tax rate). This adjustment should be made to the entire discount rate and not to its component parts (i.e., the equity risk premium). Take note that this is a "quick and dirty" way to approximate pre-tax discount rates.

The tax rate to use in this "quick and dirty" method presents yet another problem. As seen in the discussion of the weighted average cost of capital in Chapter 1, companies do not always pay the top marginal tax rate. New research has shown some progress in quantifying the expected future tax rates. See Chapter 1 for more detail.

Endnotes

[1] **Page 53** Ibbotson, Roger G., Jeffrey J. Diermeier, and Laurence B. Siegel. "The Demand for Capital Market Returns: A New Equilibrium Theory," *Financial Analysts Journal*, January/February, vol. 40, no. 1, 1984, pp. 22-33.
Mehra, Rajnish and Edward Prescott. "The Equity Premium: A Puzzle," *Journal of Monetary Economics*, vol. 15, no. 2, 1985, pp. 145–161.

[2] **Page 55** Please note that the appropriate forward-looking measure of the riskless rate is the yield to maturity on the appropriate-horizon government bond. This differs from the riskless rate used to measure the realized equity risk premium historically. Chapter 4 includes a thorough discussion of riskless rate selection in this context.

[3] **Page 58** Fama, Eugene F., and Kenneth R. French. "Permanent and Temporary Components of Stock Prices," *Journal of Political Economy*, April 1988, pp. 246–273.
Poterba, James M., and Lawrence H. Summers. "Mean Reversion in Stock Prices," *Journal of Financial Economics*, October 1988, pp. 27–59.
Lo, Andrew W., and A. Craig MacKinlay. "Stock Market Prices Do Not Follow Random Walks: Evidence from a Simple Specification Test," *The Review of Financial Studies*, Spring 1988, pp. 41–66.
Finnerty, John D., and Dean Leistikow. "The Behavior of Equity and Debt Risk Premiums: Are They Mean Reverting and Downward-Trending?" *The Journal of Portfolio Management*, Summer 1993, pp. 73–84.
Ibbotson, Roger G., and Scott L. Lummer. "The Behavior of Equity and Debt Risk Premiums: Comment," *The Journal of Portfolio Management*, Summer 1994, pp. 98–100.
Finnerty, John D., and Dean Leistikow. "The Behavior of Equity and Debt Risk Premiums: Reply to Comment," *The Journal of Portfolio Management*, Summer 1994, pp. 101–102.

[4] **Page 59** Though the study performed by Finnerty and Leistikow demonstrates that the traditional equity risk premium exhibits no mean reversion or drift, they conclude that, "the processes generating these risk premiums are generally mean-reverting."This conclusion is completely unrelated to their statistical findings and has received some criticism. In addition to examining the traditional equity risk premia, Finnerty and Leistikow include analyses on "real" risk premia as well as separate risk premia for income and capital gains. In their comments on the study, Ibbotson and Lummer show that these "real" risk premia adjust for inflation twice, "creating variables with no economic content." In addition, separating income and capital gains does not shed light on the behavior of the risk premia as a whole.

[5] **Page 59** This assertion is further corroborated by data presented in *Global Investing: The Professional's Guide to the World of Capital Markets* (by Roger G. Ibbotson and Gary P. Brinson and published by McGraw-Hill, New York). Ibbotson and Brinson constructed a stock market total return series back to 1790. Even with some uncertainty about the accuracy of the data before the mid-nineteenth century, the results are remarkable. The real (adjusted for inflation) returns that investors received during the three 50-year periods and one 51-year period between 1790 and 1990 did not differ greatly from one another (that is, in a statistically significant amount). Nor did the real returns differ greatly from the overall 201-year average. This finding implies that because real stock market returns have been reasonably consistent over time, investors can use these past returns as reasonable bases for forming their expectations of future returns.

[6] **Page 62** Goetzmann, William, and Philippe Jorion."A Century of Global Stock Markets," Working Paper 5901, National Bureau of Economic Research, 1997.

[7] **Page 62** Note that the equity risk premium referred to in the Goetzmann and Jorion paper is not the same as the equity risk premium covered in this publication. Among other differences, their equity risk premium is based on a longer history of data and does not take dividend income or reinvestment into account.

[8] **Page 62** The discounted cash flow model is a modification of the Gordon Growth model, which states that: where P_0 is the price of the security today, D_1 is the dividend from next period, k is the cost of equity, and g is the expected growth rate in dividends. The capital asset pricing model is stated as $k_i = \beta_i\,(ERP) + r_f$ where k_i is the cost of equity for company **i**, βi is the beta for company **i**, ERP is the equity risk premium, and r_f is the risk-free rate. For the market as a whole, the capital asset pricing model can be written as $k = ERP + r_f$ because the market beta, by definition, is 1. For more information on these models, see Chapter 4.

[9] **Page 63** Note that the recent increase in market volatility, particularly in 1998, may also place into question the validity of this argument.

[10] **Page 64** Ibbotson, Roger G., and Peng Chen."Long-Run Stock Returns: Participating in the Real Economy." *Financial Analysts Journal*, January/February, vol. 59, no.1, 2003, pp. 88–98.

Missouri-American Water Company

Capital Asset Pricing Model (CAPM) Cost-of-Common-Equity Estimates
for MoPSC Staff's Proxy Group of Four Water Companies Corrected
to Reflect a Projected Risk-Free Rate, a Market Equity Risk Premium which Accounts for
a Properly Derived Historical and projected Market Equity Risk Premium
as well as the Empirical Capital Asset Pricing Model (ECAPM)

	1	2	3	4	5	6
MoPSC Staff's Proxy Group of Six Water Companies	Value Line Adjusted Beta (1)	Market Risk Premium (2)	Risk-Free Rate (3)	Traditional CAPM Cost Rate (4)	ECAPM Cost Rate (5)	Indicated Common Equity Cost Rate (6)
American States Water Co.	0.75	9.31 %	4.95 %	11.93 %	12.51 %	12.22 %
Aqua American, Inc.	0.65	9.31	4.95	11.00	11.82	11.41
California Water Service	0.70	9.31	4.95	11.47	12.17	11.82
Connecticut Water Service	0.80	9.31	4.95	12.40	12.86	12.63
SJW Corp.	0.90	9.31	4.95	13.33	13.56	13.45
York Water Co.	0.70	9.31	4.95	11.47	12.17	11.82
Average				11.93 %	12.51 %	12.23 %

Notes
(1) From Column 2 of Schedule 18 of Mr. Barnes' Direct Exhibit.
(2) Average of the Ibbotson long-term arithmetic mean risk premium of 6.70% and the projected 3-5 year return of the market as calculated by the 13 week average market appreciation potential published by Value Line ended September 30, 2011 minus Mr. Barnes' projected risk-free rate. The average risk premium is 9.31%. ((6.70% + 11.91%) / 2 = 9.31%)

(3) Average of the projected risk-free rate for the years 2012 and 2013 as shown on Schedule 5 of Mr. Barnes' Direct Exhibit. ((4.90% + 5.00%) / 2 = 4.90%)
(4) Calculated as shown on page 2 of Schedule PMA-12, note 3.
(5) Calculated as shown on page 2 of Schedule PMA-12, note 4.
(6) Average of Columns 4 and 5.

Missouri-American Water Company
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 (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.	Missouri-American Water Company					
a.	Based Upon the MoPSC Staff's Proxy Group of Six Water Companies	$ 827.693		7 - 8	2.27%	
b.	Based Upon the MIEC Witness Gorman's Proxy Group of Eight Water Companies	$ 764.919		7 - 8	2.27%	
c.	Based Upon the BJC Witness LaConte's Proxy Group of Nine Water Companies	$ 746.628		8	2.65%	
2.	MoPSC Staff's Proxy Group of Six Water Companies	$ 868.516	1.0 x	7 - 8	2.27%	0.00%
3.	MIEC Witness Gorman's Proxy Group of Eight Water Companies	$ 1,319.694	1.7 x	6 - 7	1.85%	0.42%
4.	BJC Witness LaConte's Proxy Group of Nine Water Companies	$ 1,205.786	1.6 x	6 - 7	1.85%	0.80%

	(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 pages 2 - 4 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 0.42% in Column 4, Line No. 2 is derived as follows 0.42% = 2.27% - 1.85%.

Missouri-American Water Company
Market Capitalization of Missouri-American Water Company and
the MoPSC Staff's Proxy Group of Six Water Companies

Company	Exchange	1 Common Stock Shares Outstanding at Fiscal Year End 2010 (millions)	2 Book Value per Share at Fiscal Year End 2010 (1)	3 Total Common Equity at Fiscal Year End 2010 (millions)	4 Average High / Low Stock Price (7/11 - 9/11) (2)	5 Market-to-Book Ratio (3)	6 Market Capitalization (4) (millions)
Missouri-American Water Company		NA	NA	$ 415.717 (5)	NA		
Based Upon the MoPSC Staff's Proxy Group of Six Water Companies						199.1 % (6)	$ 827.693 (7)
MoPSC Staff's Proxy Group of Six Water Companies							
American States Water Co.	NYSE	18.631	$ 20.264	$ 377.541	$ 33.830	166.9 %	$ 630.282
Aqua America, Inc.	NYSE	138.449	8.481	1,174.254	21.360	251.9	2,957.271
California Water Service Group	NYSE	41.666	10.453	435.526	18.150	173.6	756.238
Connecticut Water Service, Inc.	NASDAQ	8.677	13.134	113.963	26.090	198.6	226.379
SJW Corporation	NYSE	18.552	13.747	255.032	22.870	166.4	424.274
York Water Company	NASDAQ	12.692	7.190	91.257	17.070	237.4	216.653
Average		39.778	$ 12.212	$ 407.929	$ 23.228	199.1 %	$ 868.516

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) From Schedule 16.
(3) Column 4 / Column 2.
(4) Column 5 * Column 3.
(5) From Financial Statements of Missouri-American Water Company for Fiscal Year End 2010.
(6) The market-to-book ratio of Missouri-American Water Company on October 21, 2011 is assumed to be equal to the market-to-book ratio of the MoPSC Staff's proxy group of six water companies at October 21, 2011.
(7) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 21, 2011 of the MoPSC Staff's proxy group of six water companies, 199.1%, and Missouri-American Water Company's market capitalization on October 21, 2011 would therefore have been $827.693 million.

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

Missouri-American Water Company
Market Capitalization of Missouri-American Water Company and
the MIEC Witness Gorman's Proxy Group of Eight Water Companies

Company	Exchange	1 Common Stock Shares Outstanding at Fiscal Year End 2010 (millions)	2 Book Value per Share at Fiscal Year End 2010 (1)	3 Total Common Equity at Fiscal Year End 2010 (millions)	4 13-Week Average Stock Price (2)	5 Market-to-Book Ratio (3)	6 Market Capitalization (4) (millions)
Missouri-American Water Company		NA	NA	$ 415.717 (5)	NA		
Based Upon the MIEC Witness Gorman's Proxy Group of Eight Water Companies						184.0 % (6)	$ 764.919 (7)
MIEC Witness Gorman's Proxy Group of Eight Water Companies							
American States Water Co.	NYSE	18.631	$ 20.264	$ 377.541	$ 33.950	167.5 %	$ 632.517
American Water Works Co., Inc.	NYSE	174.996	23.614	4,132.272	29.040	123.0	5,081.884
Aqua America, Inc.	NYSE	138.449	8.481	1,174.254	21.380	252.1	2,960.040
California Water Service Group	NYSE	41.666	10.453	435.526	17.930	171.5	747.071
Connecticut Water Service, Inc.	NASDAQ	8.677	13.134	113.963	26.170	199.3	227.073
Middlesex Water Company	NASDAQ	15.566	11.132	173.279	17.740	159.4	276.141
SJW Corporation	NYSE	18.552	13.747	255.032	22.570	164.2	418.708
York Water Company	NASDAQ	12.692	7.190	91.257	16.870	234.6	214.115
Average		53.654	$ 13.502	$ 844.141	$ 23.206	184.0 %	$ 1,319.694

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) From Schedule MPG-9.
(3) Column 4 / Column 2.
(4) Column 5 * Column 3.
(5) From Financial Statements of Missouri-American Water Company for Fiscal Year End 2010.
(6) The market-to-book ratio of Missouri-American Water Company on October 21, 2011 is assumed to be equal to the market-to-book ratio of the MIEC Witness Gorman's Proxy Group of Eight Water Companies at October 21, 2011.
(7) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 21, 2011 of the MIEC Witness Gorman's Proxy Group of Eight Water Companies, 184%, and Missouri-American Water Company's market capitalization on October 21, 2011 would therefore have been $764.919 million.

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

Missouri-American Water Company
Market Capitalization of Missouri-American Water Company and
the BJC Witness LaConte's Proxy Group of Nine Water Companies

Company	Exchange	1 Common Stock Shares Outstanding at Fiscal Year End 2010 (millions)	2 Book Value per Share at Fiscal Year End 2010 (1)	3 Total Common Equity at Fiscal Year End 2010 (millions)	4 8/2011 - 11/2011 Average Stock Price (2)	5 Market-to-Book Ratio (3)	6 Market Capitalization (4) (millions)
Missouri-American Water Company		NA	NA	$ 415.717 (5)	NA		
Based Upon the BJC Witness LaConte's Proxy Group of Nine Water Companies						179.6 % (6)	$ 746.628 (7)
BJC Witness LaConte's Proxy Group of Nine Water Companies							
American States Water Co.	NYSE	18.631	$ 20.264	$ 377.541	$ 34.040	168.0 %	$ 634.194
American Water Works Co., Inc.	NYSE	174.996	23.614	4,132.272	29.630	125.5	5,185.131
Aqua America, Inc.	NYSE	138.449	8.481	1,174.254	21.590	254.6	2,989.115
Artesian Resources Corp.	NASDAQ	7.637	12.459	95.146	17.910	143.8	136.779
California Water Service Group	NYSE	41.666	10.453	435.526	17.680	169.1	736.655
Connecticut Water Service, Inc.	NASDAQ	8.677	13.134	113.963	22.620	172.2	196.270
Middlesex Water Company	NASDAQ	15.566	11.132	173.279	17.520	157.4	272.716
SJW Corporation	NYSE	18.552	13.747	255.032	26.270	191.1	487.349
York Water Company	NASDAQ	12.692	7.190	91.257	16.850	234.4	213.861
Average		48.541	$ 13.386	$ 760.919	$ 22.679	179.6 %	$ 1,205.786

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) From Schedule BSL-2.
(3) Column 4 / Column 2.
(4) Column 5 * Column 3.
(5) From Financial Statements of Missouri-American Water Company for Fiscal Year End 2010.
(6) The market-to-book ratio of Missouri-American Water Company on October 21, 2011 is assumed to be equal to the market-to-book ratio of the BJC Witness LaConte's Proxy Group of Nine Water Companies at October 21, 2011.
(7) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at October 21, 2011 of the BJC Witness LaConte's Proxy Group of Nine Water Companies, 179.6%, and Missouri-American Water Company's market capitalization on October 21, 2011 would therefore have been $746.628 million.

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

Capital Structure Based upon Total Permanent Capital for the
MIEC Witness Gorman's Proxy Group of Eight 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 %
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 %
MIEC Witness Gorman's Proxy Group of Eight Water Companies						
Long-Term Debt	50.73 %	50.38 %	49.19 %	49.12 %	46.80 %	49.24 %
Preferred Stock	0.22	0.24	0.25	0.35	0.52	0.32
Common Equity	49.05	49.38	50.56	50.53	52.68	50.44
Total Capital	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %

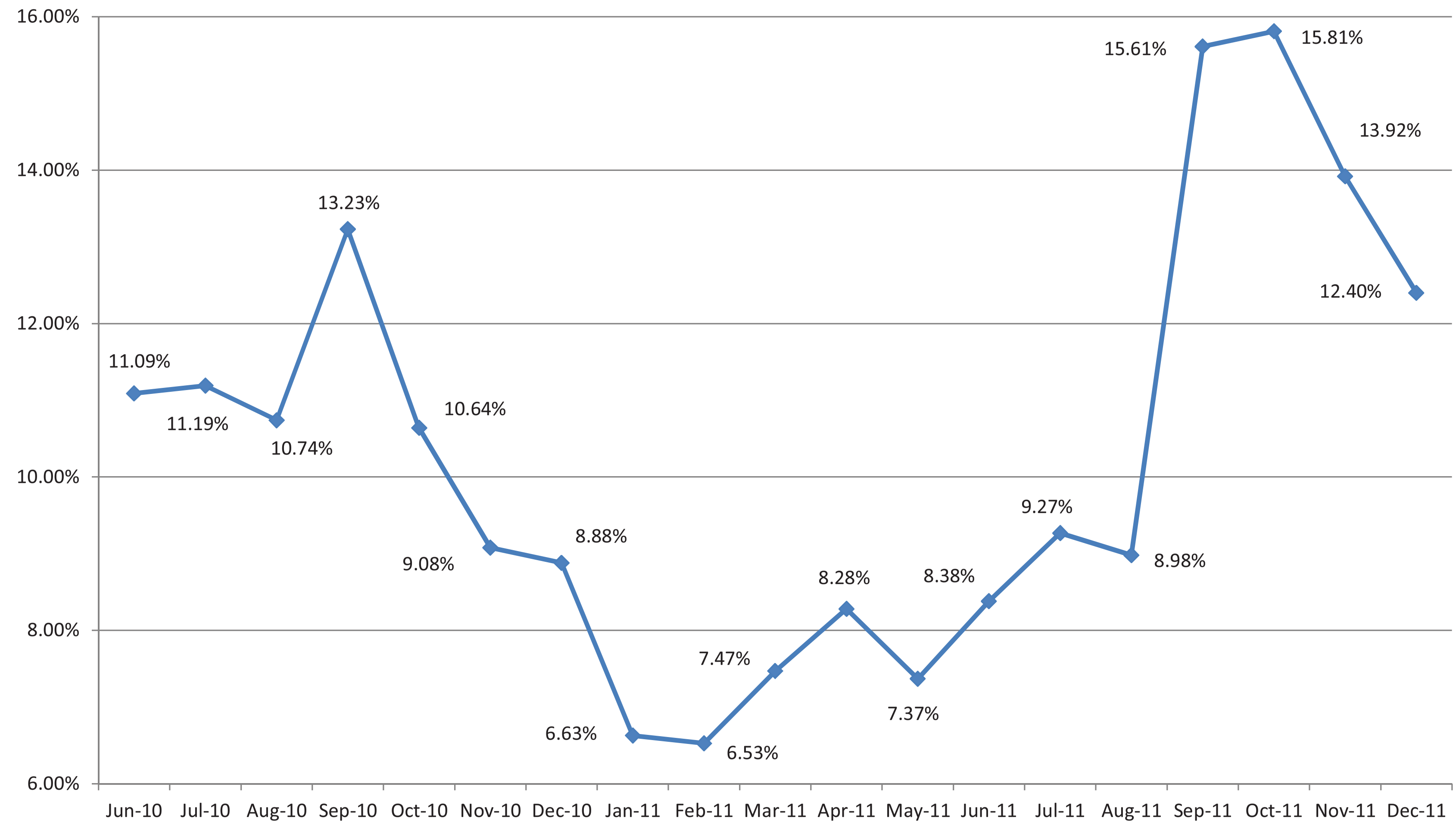
Source of Information
EDGAR Online's I-Metrix Database
Annual Forms 10-K

Missouri-American Water Company
Brief Summary of MoPSC Staff's Corrected Common Equity Cost Rate

No.	Principal Methods	MoPSC Staff's Proxy Group of Six Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	10.53 %
2.	Capital Asset Pricing Model (CAPM) (2)	12.23
3.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	11.38 %
4.	Flotation Cost Adjustment (3)	0.15
5.	Financial Risk Adjustment (4)	0.75
6.	Business Risk Adjustment (5)	0.35
7.	Indicated Common Equity Cost Rate	12.63 %

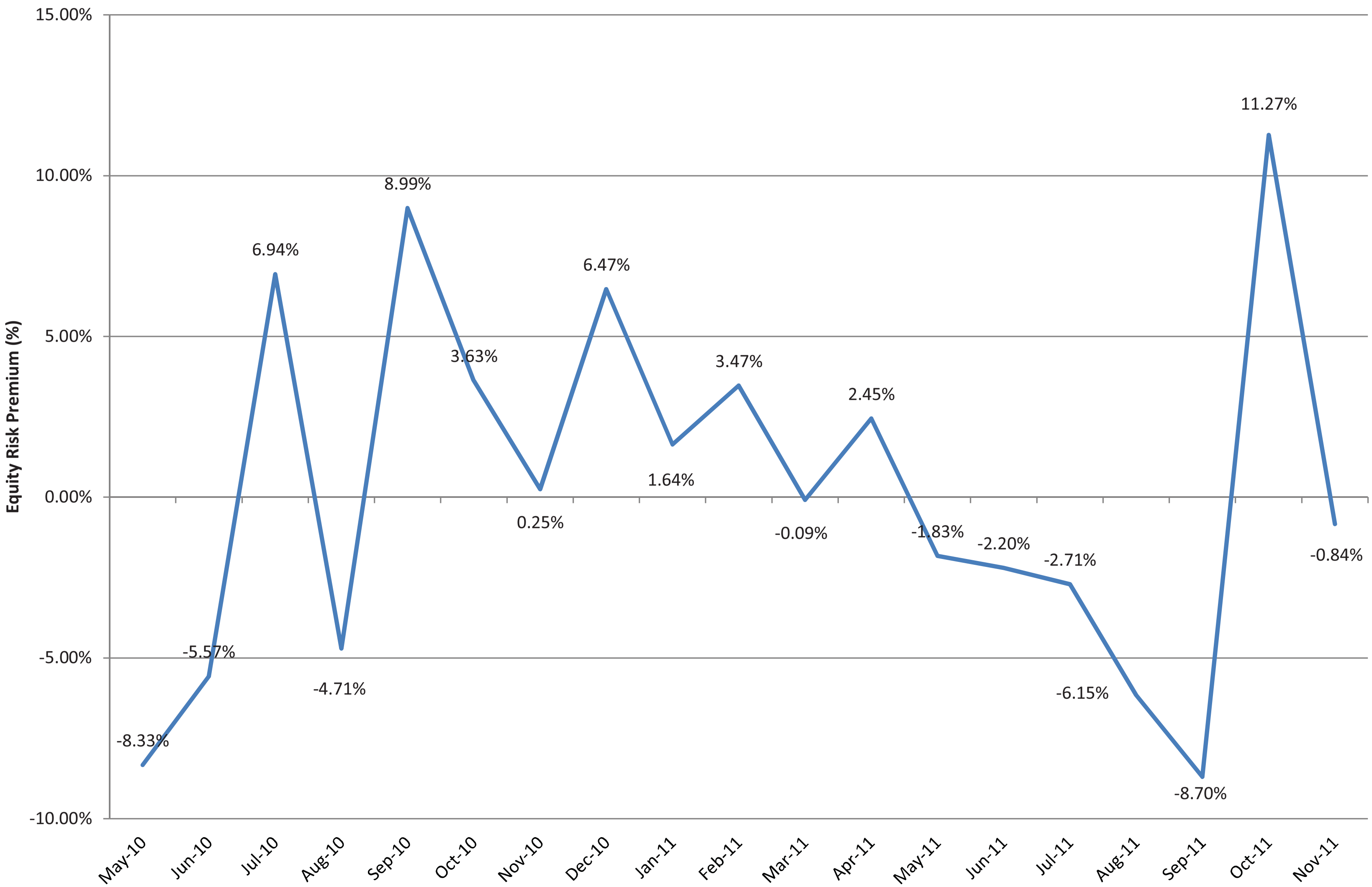
Notes:
(1) From Schedule PMA-19.
(2) From Schedule PMA-21.
(3) From Ms. Ahern's electronic rebuttal workpapers.
(4) Financial risk adjustment to reflect the greater financial risk inherent the MoPSC Staff's recommended capital structure relative to Staff's proxy group of six water companies.
(5) Business risk adjustment to reflect Missouri-American Water Company's greater unique business risks relative to the proxy group as detailed in Ms. Ahern's direct testimony.

Equity Risk Premium: Value Line Forecasted Total Annual Return Over Blue Chip Financial Forecasts 30-Year U.S. Treasury Yields



Sources of Information:
Value Line Investment Survey Summary and Index
Blue Chip Financial Forecasts

Equity Risk Premium May 2010 - November 2011



Sources of Information:

http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/index.html
http://www.federalreserve.gov/releases/H15/data.htm

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ORIGINAL ARTICLE

New approach to estimating the cost of common equity capital for public utilities

Pauline M. Ahern · Frank J. Hanley · Richard A. Michelfelder

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Abstract The regulatory process for setting public utilities' allowed rate of return on common equity has generally used the Gordon DCF, CAPM and Risk Premium specifications to estimate the cost of common equity. Despite the widely known problems with these models, there has been little movement to adopt more recently developed asset pricing models to provide additional evidence for estimating the cost of capital. This paper presents, validates empirically and applies a general yet simple consumption-based asset pricing specification to model the risk-return relationship for stocks and estimate the cost of common equity for public utilities. The model is not necessarily superior to other models in its practical results, yet these results do indicate that it should be used to provide additional estimates of the cost of common equity. Additionally, the model raises doubts as to whether assets such as utility stocks are a consumption (business cycle) hedge.

Keywords Public utilities · Cost of capital · GARCH · Consumption asset pricing model

JEL Classification G12 · L94 · L95

P. M. Ahern · F. J. Hanley
AUS Consultants, Mt. Laurel, NJ 08054, USA
e-mail: pahern@ausinc.com

F. J. Hanley
e-mail: Fhanley@ausinc.com

R. A. Michelfelder (✉)
School of Business, Rutgers University,
Camden, NJ 08102-1656, USA
e-mail: richmich@rutgers.edu

1 Introduction

Following electricity deregulation with the National Energy Policy Act of 1992, the estimation of the cost of common equity capital remains a critical component of the utility rate-of-return regulatory process. Since the cost of common equity is not observable in capital markets, it must be inferred from asset pricing models. The models that are commonly applied in regulatory proceedings are the Gordon (1974) Discounted Cash Flow (DCF), the Capital Asset Pricing (CAPM) and Risk Premium Models. There are other tools used to estimate the cost of common equity such as comparable earnings or earnings-to-price ratios, but they are not asset pricing models. The empirical literature on the CAPM is vast {Fama and French (2004)} and the CAPM is used by a number of US regulatory jurisdictions. The DCF model has not been empirically tested to the same extent as the CAPM, yet it is considered by many US regulatory jurisdictions.

The purpose of this paper is to present, test empirically and apply a recently developed general consumption-based asset pricing model that estimates the risk-return relationship directly from asset pricing data and, when estimated with recently developed time series methods, produces a prediction of the equity risk premium that is driven by its predicted volatility. The predicted risk premium is then added to a risk-free rate of return to provide an estimate of the cost of common equity. We predict two forms of the equity risk premium with the model, the risk premium net of the risk-free rate and the equity-to-debt risk premium (equity risk premium net of the relevant bond yield for the company's stock). Either can be applied to predict the common equity cost of capital for a public utility. Although the model is tested and applied to public utilities for rate of return regulation, it can be used to estimate the cost of capital for any stock. Section 2 reviews the asset pricing models typically used in public utility rate cases and the generalized consumption asset pricing model we propose to estimate the cost of common equity. Section 3 discusses the data and the empirical testing of the consumption asset pricing model. Section 4 reviews the application of the model and compares it with the DCF and CAPM results. Section 5 is the conclusion.

2 DCF, CAPM and consumption asset pricing model

2.1 DCF and CAPM approaches

The standard DCF model frequently used in estimative the cost rate of common equity in regulatory proceedings is defined by the following equation:

$$k = D_0 (1 + g) / P_0 + g,$$

where k is the expected return on common equity; D_0 is the current dividend per share; g is the expected dividend per share growth rate; and P_0 is the current market price.

The DCF was developed by Gordon (1974) specifically for regulatory purposes. Underlying the DCF model is the theory that the present value of an expected future stream of net cash flows during the investment holding period can be determined by discounting those cash flows at the cost of capital, or the investors' capitalization rate. DCF theory indicates that an investor buys a stock for an expected total return rate which is derived from cash flows received in the form of dividends plus appreciation in market price (the expected growth rate) over the investment holding period. Mathematically, the expected dividend yield ($D_0(1+g)/P_0$) on market price plus an expected growth rate equals the capitalization rate, i.e., the expected return on common equity.

The standard DCF contains several restrictive assumptions, the most contentious of which during utility cost of capital proceedings is typically that dividends per share (DPS), book value per share (BVPS), earnings per share (EPS) as well as market price grow at the same rate in perpetuity. There is also considerable contention over the proper proxy for g, prospective or historical growth in DPS, BVPS, EPS and market price and over what time period. In addition, although the standard DCF described above is a single stage annual growth model, there is considerable discussion over the use of multiple stage growth models during regulatory proceedings. Some analysts use the discrete version and others use the continuous version of the DCF model. Solving these models for k, the cost of common equity, results in differing equations to solve for k. The equation above is from the discrete version. The continuous version uses the current dividend yield and is not adjusted by g, which results in a lower estimate for k. Because of these and other restrictive assumptions that require numerous subjective judgments in application, it is often difficult for regulatory commissions to reconcile the frequently large disparities in rates of return on common equity recommended by various parties in a public utility rate case.

The CAPM model is defined by the following equation:

$$k = R_f + \beta \left(R_m - R_f\right),$$

where k is the expected return on common equity; R_f is the expected risk-free rate of return; β is the expected beta; and R_m is the expected market return.

CAPM theory defines risk as the co-variability of a security's returns with the market's returns or β, also known as systematic or market risk, with the market beta being defined as 1.0. Because CAPM theory assumes that all investors hold perfectly diversified portfolios, they are presumed to be exposed only to systematic risk and the market (according to the model) will not reward them a risk premium for unsystematic or non-market risk. In other words, the CAPM presumes that investors require compensation only for systematic or market risks which are due to macroeconomic and other events that affect the returns on all assets. Mathematically, the CAPM is applied by adding a forward-looking risk-free rate of return to an expected market equity risk premium adjusted proportionately by the expected beta to reflect the systematic risk.

As with the DCF, there is considerable contention during regulatory cost of capital proceedings as to the proper proxies for all components of the CAPM: the R_f, the R_m, as well as β. In addition, the CAPM assumption that the market will only reward investors for systematic or market risk is extremely restrictive when estimating the expected return on common equity for a single asset such as a single jurisdictional regulated operating utility. Additionally, this assumption requires that the investor have a perfectly diversified portfolio, that is, one with no unsystematic risk. Since this assumption is not applicable, estimating the cost of common equity capital for a single utility's common equity undoubtedly will not reflect the risk actually faced by the imperfectly diversified investor.

As will be discussed in the next section, our application of the risk premium approach, the consumption asset pricing model and GARCH[1] rest on minimal assumptions and restrictions and therefore requires considerably less judgment in its application.

2.2 Risk premium approach, consumption asset pricing models, and GARCH

A widely used model to estimate the cost of common equity capital for public utilities is the risk premium approach. This approach often estimates the expected rate of return as the long-term historic mean of the realized risk premium above an historic yield plus the current yield of the relevant bond applicable to a specific utility or peer group of utilities. Litigants in public utility rate proceedings debate the choice of inputs to estimate the risk premium as well as how far back to reach into history to collect data for calculating an average that is representative of a forward-looking premium.

It is surprising that, as popular as the risk premium method is in public utility rate cases, the intuitively appealing general consumption-based asset pricing model, with its minimal assumptions and strong theoretical foundation, has not been applied to estimate the cost of common equity capital for public utilities. The model provides projections of the conditional expected risk premium on an asset based on its relation to its predicted conditional volatility. This model generalizes the well known special case asset pricing models such as the Merton (1973) intertemporal capital asset pricing model, Campbell (1993) intertemporal asset pricing model, and the habit-persistence model of Campbell and Cochrane (1999), which are special cases of the general model. The relation of the model to their specialized cases can be found in Cochrane (2006) and Cochrane (2007). The approach of consumption asset pricing models is to make investment decisions that maximize investors' utility from the consumption that they ultimately desire, not returns.

Even if the model is not used to project directly the expected risk premium, it can, at a minimum, be used to verify that the risk premia data chosen for estimating the cost of capital is empirically validated by fitting the model well. The model can be used to predict the equity risk premia net of the risk-free rate (equity risk premium) or to predict the equity-to-debt risk premium for a firm. We perform both of these empirical tests in this paper. The general consumption-based asset pricing model developed in Michelfelder and Pilotte (2011) and based on Cochrane (2004) provides the relationship of the ex ante risk premium to an asset's own volatility in return:

$$E_t[R_{i,t+1}] - R_{f,t} = -\frac{vol_t[M_{t+1}]}{E_t\left[M_{t+1}\right]} vol_t[R_{i,t+1}] corr_t[M_{t+1}, R_{i,t+1}]. \quad (1)$$

[1] GARCH refers to the generalized autoregressive conditional heteroskedasticity regression model which is discussed below.

where vol_t is the conditional volatility, $corr_t$ is the conditional correlation, and M_{t+1} is the stochastic discount factor (SDF).

The SDF is the intertemporal marginal rate of substitution in consumption, or, $M_{t+1} = \beta \frac{U_{c,t+1}}{U_{c,t}}$, where the U_c's are the marginal utilities of consumption in the next period, $t + 1$, and the current period, t, and β is the discount factor for period t to $t + 1$. Equation 1 shows that the algebraic sign of the relation between the expected risk premium and the conditional volatility of an asset's risk premium is determined by the correlation between the asset's return and the SDF. That is, the direction of the relation between the asset return and the ratio of intertemporal marginal utilities in consumption inversely determines the relation between the expected risk premium and conditional volatility. When the correlation is equal to negative one, the asset's conditional expected risk premium is perfectly positively correlated with its conditional volatility. A positive relation between the conditionally expected risk premium and volatility obtains when $-1 < corr_t < 0$. A negative relation obtains when $0 < corr_t < 1$. For an asset that represents a perfect hedge against shocks to the marginal utility of consumption, with $corr_t = 1$, there will be a perfect negative correlation between the conditionally expected risk premium and its volatility.[2] Therefore, estimates of the relation between the first two conditional moments of a public utility stock's returns provide a direct test of the effectiveness of a public utility stock, or any asset, as a consumption hedging asset. In Eq. 1, $vol_t[M_{t+1}]/E_t[M_{t+1}]$ is the slope of the mean-variance frontier. If this slope changes over time, the estimated relation between the stock's risk and return will vary over time. This model can also be viewed simplistically as the projected expected risk premium as a function of its own projected risk, given information available at time t.

Note that the model allows for the expected risk premium to be negative if the asset hedges shocks to the marginal utility of consumption. Investors are willing to accept an expected rate of return lower than the risk-free rate of return if the pattern of volatility is such that returns are expected to rise with expected reductions in consumption. Simply, investors are willing to *pay* a premium for a higher level of returns volatility that has the desired pattern of returns. These desired returns patterns have a tendency to offset drops in consumption. Therefore, this model shows that investors may not be averse to volatility, but rather to the timing of expected changes in returns.

Summarizing, several conclusions can be drawn from the general model of asset pricing. First, the sign of the relation between a stock's risk premium and conditional volatility depends on the extent to which the stock serves as an intertemporal hedge against shocks to the marginal utility of consumption. Second, the relation between stock risk and return may be time-varying depending on changes in the slope of the mean-variance frontier. Third, hedging assets have desired patterns of volatility that result in expected rates of return that are less than the risk-free rate. We do not expect

[2] A hedging asset is one that has a positive increase in returns that is coincident with a positive shock in the ratio of intertemporal marginal utilities of consumption. Note that if we assume a concave utility function in consumption, as consumption declines, the marginal utility of consumption rises relative to last period marginal utility. If we think of a decline in consumption as a contraction in the business cycle, the hedging asset delivers positive changes in returns when the business cycle is moving into a contraction, and therefore the asset is a business cycle hedge.

that public utility stocks serve as a hedging asset as they are not viewed as defensive stocks (they do not rise in value during downturns in the stock market) due to asymmetric regulation and returns as discussed in detail in Kolbe and Tye (1990). Under asymmetric regulation, utility regulators have a tendency to allow the return on equity to fall below the allowed return during downturns in the business cycle and to reduce the return should it rise above the allowed return during expansions. Therefore we expect that the parameter estimates of the return-risk relationship to be positive as utility stocks are hypothesized to not be hedges.

We use the GARCH model to estimate the general asset pricing model since the GARCH model accommodates ARCH effects that improve the efficiency of the parameter estimates. It also provides a volatility forecasting model for the conditional volatility of the asset's risk premium. The conditional volatility projection is used, in turn to predict the expected risk premium. We also use the GARCH-in-Mean model (GARCH-M) since it specifies that the conditional expected risk premium is a linear function of its conditional volatility. There is a vast body of literature that estimates asset pricing models with the GARCH and GARCH-M methods and therefore we will not attempt to summarize them here.

The GARCH-M model was initially developed and tested by Engle et al. (1987) to estimate the relationship between US Treasury and corporate bond risk premia and their expected volatilities. The GARCH-M model is specified as:

$$R_{t+1} - R_{f,t+1} = \alpha\sigma_{t+1}^2 + \varepsilon_{t+1} \tag{2}$$

$$\sigma_{t+1}^2 = \beta_0 + \beta_1\sigma_t^2 + \beta_2\varepsilon_t^2 + \eta_{t+1} \tag{3}$$

$$\varepsilon_t \,|\psi_{t-1} \sim T(0, \sigma_t^2) \tag{4}$$

where R_{t+1} is the expected total return on the public utility stock index or individual utility stock; $R_{f,t+1}$ is the risk-free rate of return or the yield on an index of public utility bonds of a specified bond rating for the equity-to-debt premium; σ_{t+1}^2 is the conditional or predicted variance of the risk premium that is conditioned on past information (ψ_{t-1}); and ε_t is the error term that is conditional on ψ_{t-1}.

The conditional distribution of the error term is specified as the non-unitary variance T-distribution due to the thick-tailed distribution of the risk premia data. If the error distribution is thick-tailed, using an approximating distribution that accommodates thick tails improves the efficiency of the estimates. The parameter, α, is the return-to-risk coefficient as specified in Eq. 1 as:

$$\alpha = -\frac{vol_t[M_{t+1}]}{E_t\left[M_{t+1}\right]} corr_t[M_{t+1}, R_{i,t+1}] \tag{5}$$

Note that the coefficient will be positive if the conditional correlation between the SDF and the asset return is negative, indicating that the stock is not a hedging asset. Recall that the SDF is the ratio of intertemporal marginal utilities. Assuming a concave utility function, an upward shock in the ratio implies falling consumption, therefore an associated rise (positive correlation) in the return (R_i) would offset the reduction in consumption, thereby causing the sign of α to be negative. The parameter, α, is also the ratio of risk premium to variance, or, the Sharpe ratio.

The intercept in Eq. 2 is restricted to zero as specified by the general asset pricing model specification. The restriction on the intercept equal to zero has been found to be robust in producing consistently positive and significant relationships between equity risk premia and risk in GARCH-M models. This is discussed in Lanne and Saikkonen (2006) and Lanne and Luoto (2007). We have found the same results in our modeling in this paper, although we have excluded these results for brevity (available upon request). Therefore we specify the prior assumption that the intercept or the "excess" return, i.e., the return not associated with risk to be equal to zero and drop the intercept from the model.

The consumption asset pricing model is estimated in the empirical section of the paper and applied in the applications section of the paper. The model is tested to (1) determine if equity-to-debt risk premium indices for utilities of differing risk specified by differing bond ratings are validated by the asset pricing model and therefore have some empirical support for risk premium prediction and application to utility cost of capital estimation, (2) determine whether equity risk premia can be predicted and fit the model and therefore be used to estimate the cost of common equity, (3) empirically test the consumption asset pricing model, and (4) ascertain whether utility stocks are assets that hedge shocks to the marginal utility of consumption.

If utility stocks are hedging assets then the cost of common equity should reflect a downward adjustment to a specified risk-free rate to reflect investors' preferences for a hedge and the compensation that they are willing to pay for it.

3 Data and empirical results

We use portfolios as represented by public utility stock and bond indices to estimate the conditional return-risk relationship for the equity-to-debt premium. The equity-to-debt risk premium data employed for estimating Eq. 1 with the GARCH-M conditional return-risk regressions are monthly total returns on the Standard and Poor's Public Utilities Stock Index (utility portfolio), and the monthly Moody's Public Utility Aa, A, and Baa yields for the debt cost. We also obtained equity risk premia for the utility portfolio using the Fama-French specified risk-free rate of return, which is the holding period return on a 1-month US Treasury Bill. The data range from January 1928 to December 2007 with 960 observations. The return-risk relationships for the equity-to-debt premia are risk-differentiated by their own bond rating.

As a check, we also estimate Eq. 1 with the GARCH-M for large common stock returns using the monthly Ibbotson Large Company Common Stocks Portfolio total returns and the Ibbotson US Long-Term Government income returns as the risk-free rate. Additionally, as another check, we do the same for the University of Chicago's Center for Research in Security Prices value-weighted stock index (CRSP) using the Fama-French risk-free rate. This is the Fama-French specification of the market equity risk premium. The data range from January 1926 to December 2007 with 984 observations for the Large Company Common Stock estimation and the data ranges

Table 1 Descriptive statistics: public utility and large company common stocks equity-to-debt and equity risk premia

Utility bond rating	Mean	Std. Dev.	Skewness	Kurtosis	JB
Aa	0.0037	0.0568	0.0744	10.07	2,001.2***
A	0.0035	0.0568	0.0632	10.06	1,991.8***
Baa	0.0031	0.0568	0.0375	10.02	1,973.6***
Ibbotson					
Large common stocks	0.0054	0.0554	0.4300	12.84	3,954.7***
CRSP value-weighted stock index	0.0062	0.0544	0.2309	10.92	2,519.1***

The public utility equity-to-debt risk premia monthly time series is from January 1928 to December 2007 with 960 observations. The equity risk premium monthly time series for the Large Common Stocks and the CRSP index are January 1926 to December 2007 with 984 observations, and January 1926 to December 2007 with 984 observations, respectively. The public utility stocks equity-to-debt risk premia are calculated as the total return on the S&P Public Utilities Index of stocks minus the Moody's Public Utility Aa, A, and Baa Indices yields to maturity. The Large Company Common Stock equity risk premia are the monthly total returns on the Ibbotson Large Company Common Stocks Portfolio minus the Ibbotson Long-Term US Government Bonds Portfolio income yield. The CRSP equity risk premia, or the Fama-French market risk premia are the CRSP total returns on the value-weighted equity index minus the 1-month holding period return on a 1 month Treasury Bill. The Jarque-Bera (JB) statistic is a goodness-of-fit measure of the departure of the distribution of a data series from normality, based on the levels of skewness and excess kurtosis. The JB statistic is χ^2 distributed with 2° of freedom. *** Significant at 0.01 level, one-tailed test

from January 1928 to January 2007 with 960 observations (same as the utilities) for the CRSP estimation.

Table 1 displays the descriptive statistics for these data. We have estimated the mean, standard deviation, skewness and kurtosis parameters, as well as the Jarque-Bera (JB) statistic to test the distribution of the data. The means of the utility equity-to-debt risk premia fall as the risk (bond rating) declines. This is consistent with the notion that larger yields are subtracted from stock returns the lower the bond rating. Intertemporally, there is an inverse relationship between risk premia and interest rates (See Brigham et al. (1985) and Harris et al. (2003)). The mean for risk premia will have a tendency to be larger during low interest rate periods.

Not surprisingly, large company common stocks have the highest mean risk premia as the majority of these firms are not rate-of-return regulated firms with a ceiling on their ROE's close to their cost of capital. Interestingly, the standard deviations of the utility stock returns are similar and slightly higher than large company common stocks. Skewness coefficients are small and positive except for Ibbotson large company common stock returns and CRSP returns that have large positive skewness. This suggests that large unregulated stocks have a tendency to have more and larger positive shocks in returns than do utilities that are rate of return regulated. The kurtosis values show that all of the risk premia are thick-tail distributed. This is also found in the significant JB statistics that test the null hypothesis that the data are normally distributed. The null hypothesis is rejected for all assets. The high kurtosis, low skewness, and significant JB statistics show that the risk premia data are substantially thick-tailed, except for non-utility stocks that are both skewed and thick-tailed. Therefore, robust estimation methods are required to produce efficient regression estimates with non-normal data. Additionally, although not shown but available upon request, the serial correlation and

ARCH Lagrange Multiplier tests show that residuals from OLS regressions of risk premia on volatilities follow an ARCH process. Therefore, the GARCH-M method will improve the efficiency of the estimates. We specify the regression error distribution as a non-unitary variance T-distribution so that thick-tails could be accommodated in the estimation and therefore produce increasingly efficient parameter estimates.

We used maximum likelihood estimation with the likelihood function specified with the non-unitary-variance T-distribution as the approximating distribution of the residuals to accommodate the thick-tailed nature of the error distribution. The equations are estimated as a system using the Marquardt iterative optimization algorithm. The chosen software for estimating the model was EViews© version 6.0 (2007).

Table 2 shows the GARCH-M estimations for the consumption asset pricing Eq. 1. We have estimated Eq. 1 for the utility equity risk premia using the Fama-French risk-free rate in addition to the equity-to-debt risk premia risk-differentiated by bond ratings and the two measures of the market equity risk premium. The chosen measure of volatility is the variance of risk premium (in contrast to other such measures such as the standard deviation or the log of variance. Although these results are not shown for brevity, they are robust to these other measures of volatility). The slope, which is the predicted return-to-predicted risk coefficient and Sharpe ratio, is positive and significant at the 99% level for all assets except the utility stock returns with Baa bonds, which is significant at the 95% level. Given that all slopes are positive, public utility stocks are not found to hedge shocks to the marginal utility of consumption. Note that the reward-to-risk slope rises as bond rating rises. This suggests that lower risk utility stocks provide a higher incremental risk-premium for an increase in conditional volatility. This is consistent with other studies that find that lower risk assets, such as shorter maturity bonds, have higher Sharpe Ratios than long-term bonds and stocks. See Pilotte and Sterbenz (2006) and Michelfelder and Pilotte (2011).

The variance equation shows that all GARCH coefficients (β's) are significant at the 1% level and the sums of β_1 and β_2 are close to, but less than 1.0, indicating that the residuals of the risk premium equation follow a GARCH process and that the persistence of a volatility shock on returns and stock prices for utility stocks is temporary. The estimates of the non-unitary variance T-distribution degrees of freedom parameter are low and statistically significant, indicating that the residuals are well approximated by the T. Similar values for the log-likelihood functions (Log-L) show that each of the regressions has a similar goodness-of-fit. Chi-squared distributed likelihood ratio tests (not shown but available upon request) that compare the goodness of fit among the T and normal specifications of the likelihood function of the GARCH-M regressions show that the T has a significantly better fit than the normal distribution.

The GARCH-M results for the large company common stocks portfolio are similar to those of the utility stocks. Not surprisingly, large company common stocks do not hedge shocks to the marginal utility of consumption and volatility shocks temporarily affect their valuations. The exception is that the return-risk slope is substantially higher than utility stock slopes. This is partially due to the risk-free nature of the risk-free rates used with the non-utility equity risk premia compared to the

Table 2 Estimation of return-risk relation: public utility and large company common stocks

Utility bond rating	α	β_0	β_1	β_2	Log-L	T dist. D.F.
Aa	1.5183***	0.0000**	0.8791***	0.1031***	1,604.4	9.9254***
	(0.5308)	(0.0000)	(0.0230)	(0.0219)		(3.0272)
A	1.4536***	0.0000**	0.8790***	0.1033***	1,605.0	9.9381***
	(0.5308)	(0.0000)	(0.0230)	(0.0220)		(3.0408)
Baa	1.3318**	0.0000**	0.8789***	0.1040***	1,605.2	10.0***
	(0.5303)	(0.0000)	(0.0229)	(0.0220)		(3.0540)
Fama-French R_f	2.1428***	0.0000**	0.8811***	0.0979***	1,601.0	9.8773***
	(0.5318)	(0.0000)	(0.0232)	(0.0212)		(2.9700)
Ibbotson						
Large company common stocks	2.7753***	0.0001***	0.8381***	0.1186***	1,620.8	8.8457***
	(0.5513)	(0.0000)	(0.0269)	(0.0332)		(2.1613)
CRSP value-weighted stock index	3.3873***	0.0001***	0.8330***	0.1149***	1,598.9	8.8571***
	(0.5673)	(0.0000)	(0.0270)	(0.0358)		(1.9505)

The results below are the GARCH-in-Mean regressions for the risk premium $(R_{t+1} - R_{f,t+1})$ on the conditional variance of the risk premium (σ^2_{t+1}) in the mean equation. The intercept in the mean equation is restricted to be equal to zero. The public utility equity-to-debt risk premia monthly time series is from January 1928 to December 2007 with 960 observations. The equity risk premium monthly time series for the Large Company Common Stocks and the CRSP index are January 1926 to December 2007 with 984 observations, and January 1926 to December 2007 with 984 observations, respectively. The public utility stocks equity-to-debt risk premia are calculated as the total return on the S&P Public Utilities Index of stocks minus the Moody's Public Utility Aa, A, and Baa Indices yields to maturity. The Large Company Common Stock equity risk premia are the monthly total returns on the Ibbotson Large Company Common Stocks Portfolio minus the Ibbotson Long-Term US Government Bonds Portfolio income yield. The CRSP equity risk premia, or the Fama-French market risk premia are the CRSP total returns on the value-weighted equity index minus the 1-month holding period return on a 1 month Treasury Bill. The estimated model is:

$$R_{t+1} - R_{f,t+1} = \alpha\sigma^2_{t+1} + \varepsilon_{t+1} \quad \text{where } \alpha = -\frac{vol_t[M_{t+1}]}{E_t[M_{t+1}]} corr_t[M_{t+1}, R_{i,t+1}]$$

$$\sigma^2_{t+1} = \beta_0 + \beta_1\sigma^2_t + \beta_2\varepsilon^2_t + \eta_{t+1}$$

The conditional distribution of the error term is the non-unitary variance T-distribution to accommodate the kurtosis of the risk premia and error term. Standard errors are in parentheses. ***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively for two-tail tests

utility bond yields that reflect risk. The utility stocks slope value of 2.1428 using the Fama-French risk-free rate is closer to the higher CRSP value of 3.3873 that is also based on the Fama-French risk-free rate. This is inconsistent with previous results herein and in other papers that find that Sharpe Ratios are lower for higher risk assets unless this finding can be interpreted as utility stocks having more risk than non-regulated stocks. The standard deviations on Table 1 suggest that utility stock return volatilities are as high as the stock returns of non-regulated firms. However, similar model estimates of portfolios of common stocks yield unstable results, such as negative as well as positive return-risk slopes when the intercept is not restricted to zero. See Campbell (1987), Glosten et al. (1993), Harvey (2001), and Whitelaw (1994).

Stock market results are highly sensitive to empirical model specification. Many studies do not consider the impact of a zero-intercept prior restriction on the stability of their results. This simple innovation has led to more consistent results in modeling stock market risk-return relationships, and therefore we have included it in this paper.

The estimation of the consumption asset pricing model for utility stock equity-debt risk premia shows that the use of bond-rating risk-differentiated risk premia are validated as their risk-return relationships are well-fitted by theoretical and empirical models of risk and return. Therefore, these data impound good representations of the risk and reward relationship.

One concern is the intertemporal stability of the alphas. Figure 1 plots the utility stock portfolio alpha (using the Fama-French R_f to calculate the premium) and its standard error for 240 month rolling regressions of the model estimated with GARCH-M in the same manner as described above to review the intertemporal stability of the alpha. A 20-year period was used for each estimation to trade off timeliness with sufficient observation of up and down stock market regimes and business cycles. This resulted in 720 estimated alphas from 1947 to 2007. The results show that the utility alpha is stable to the extent that the algebraic sign is always positive and generally significant, therefore the nature of utility stocks are assets that are not and have never been hedges during the second half of the twentieth century up to the present. The value of the alpha does change substantially. The mean of the alpha is 4.40 with a range from -0.11 (insignificantly different from 0) to 11.66. As a comparison, the alpha for the CRSP value-weighted stock index was also estimated with rolling regressions in the same manner and for the same time period. Figure 2 is a plot of the CRSP alpha and standard error. Note that the general stock market alpha is similar to that of utility stocks. They are all positive and almost all statistically significant and follow a strikingly similar cycle. Figure 3 plots both the utility and stock market alphas and demonstrates the similarity. The correlation coefficient between the utility and stock market alphas is 0.88. Recalling that the alpha is a Sharpe Ratio, we see that return to risk ratio does change substantially. This is consistent with the results in Pilotte and Sterbenz (2006).

One other interesting observation is that the standard errors of the alphas are highly stable over the study period and are very similar in magnitude regardless of the size of the corresponding alpha. Whereas the alpha follows a cyclical pattern, the volatility in alpha is highly stationary around a constant, long-run mean.

The GARCH-M model estimations of the consumption asset pricing model were specified with variance as the measure of volatility. We also performed the same model estimations with alternative specifications of volatility such as the standard deviation and the log of variance and the results were not sensitive to this specification.

4 Application

We apply the model in this section to compare the cost of common equity capital estimates with the DCF and CAPM models. Using EViews© Version 6.0, we estimated the model coefficients (α, $\beta's$) over rolling 24 month periods ending December 2008.

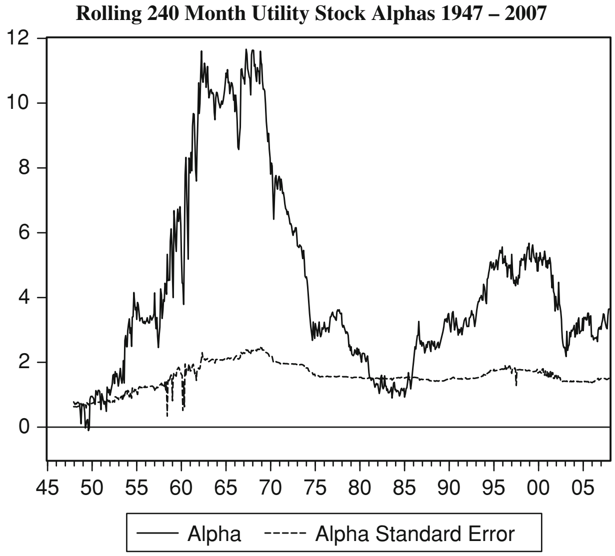


Fig. 1 Rolling 240 month utility stock alphas 1947–2007

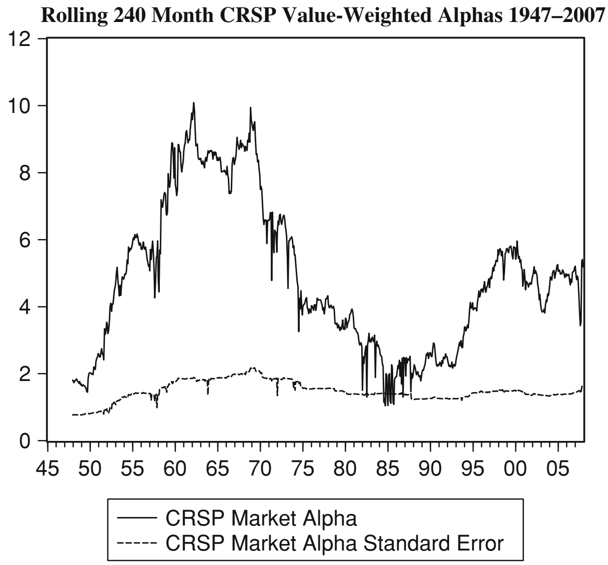


Fig. 2 Rolling 240 month CRSP value-weighted alphas 1947–2007

We repeated the estimation over 5, 10, 15, 20 and 79 year periods.[3] Predicted monthly variances (σ^2_{t+1}) were generated from these estimations to produce predicted risk premiums that were calculated by multiplying the predicted variance by the "α" slope

[3] We did not include the results of the 10 and 15 year estimations to abbreviate the amount of empirical results presented since they added no material insights beyond those already presented.

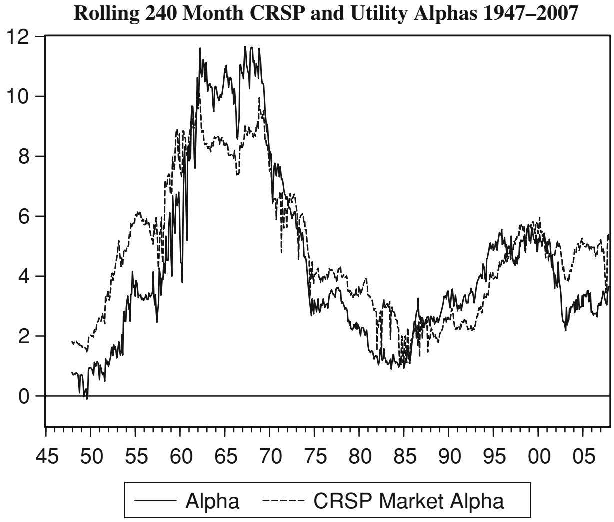


Fig. 3 Rolling 240 month CRSP and utility alphas 1947–2007

Table 3 Estimates of expected risk premia

	Mean (%)		Range (%)		Standard deviation (%)	
	Average	Spot	Average	Spot	Average	Spot
Ibbotson Associates data						
79-years	9.59	5.76	8.74–9.96	2.62–22.60	0.32	5.24
20-years	6.77	6.94	4.99–8.50	2.24–28.95	0.95	6.88
5-years	4.20	10.25	−98.49–11.62	−100.00–39.65	22.00	26.61
S&P Utility Index						
79-years	5.28	2.90	4.30–5.28	1.65–8.15	0.32	1.60
20-years	3.93	3.51	2.78–5.03	2.18–6.88	0.57	1.11
5-years	31.82	326.63	7.77–156.97	6.12–6465.74	31.47	1283.51

coefficient. To test the stability of the predicted risk premia over time, the predicted risk premia were calculated using either the predicted variance over each entire time period or the last monthly (spot) predicted variance. Table 3 presents the mean predicted risk premia, the range of predicted premia and the standard deviations for each time period. It is clear from the results that the risk premia are more stable over the rolling 24 month period when calculated using the average predicted variance compared with using the spot variance. Secondly, the 20 and 79 year means are substantially more stable and reasonable in magnitude than the 5 year means.

Next, given the lessons from the analyses above, we apply the model to mechanically[4] estimate the cost of common equity for 8 utility companies using the model and

[4] The term "mechanically" in this context means that the resulting values have been developed in a consistent manner with the same inputs across all utility stocks but no subjective judgment was used to develop final values for each specific utility stock application.

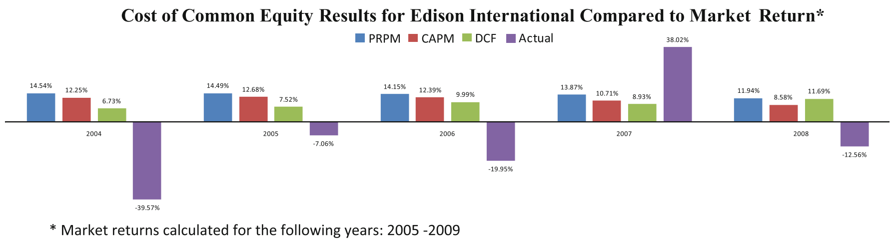
the DCF and CAPM as comparisons. We also calculated the realized market return for comparison. Two publicly-traded electric, electric and gas combination, gas, and water utilities respectively were chosen for the application. The Gordon (1974) DCF and CAPM models are used in many utility regulatory jurisdictions in the US.

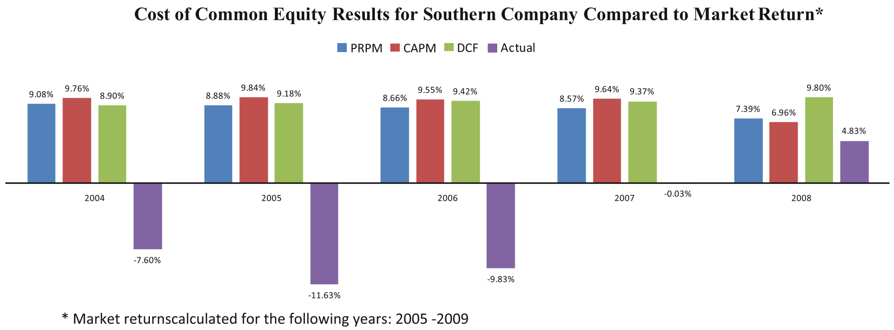
The DCF was applied using a dividend yield, D_0/P_0, derived by dividing the year-end indicated dividend per share (D_0) by the year-end spot market price (P_0). The dividend yield is grown by the year-end I/B/E/S five year projected earnings per share growth rate (g) to derive $D_0(1+g)/P_0$. The one-year predicted dividend yield is then added to the I/B/E/S five-year projected EPS growth rate to obtain the DCF estimate of the cost of common equity capital, k. This study was conducted for the 5 years ending 2008.

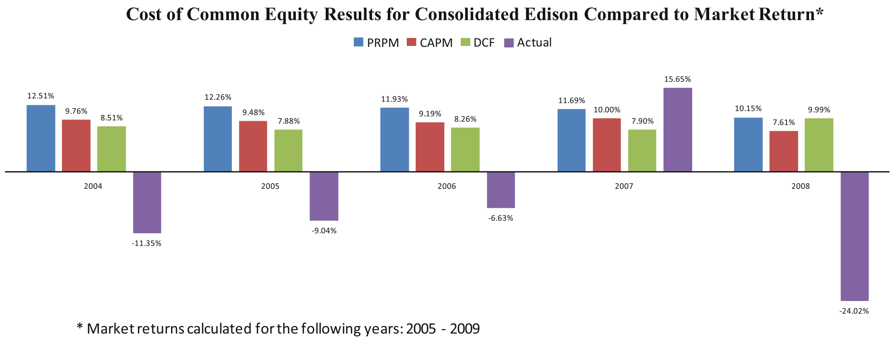
The CAPM was applied by multiplying the Value Line beta (β) available at year-end for each company by the long-term historic arithmetic mean market risk premium ($R_m - R_f$). $R_m - R_f$ is derived as the spread of the total return of large company common stocks over the income return on long-term government bonds from the Ibbotson SBBI 2009 Valuation Yearbook. The resulting company-specific market equity risk premium is then added to a projected consensus estimate of the yield on 30-year U.S. Treasury rate provided by Blue Chip Financial Forecasts as the risk-free rate (R_f) to obtain the CAPM result. This study was also conducted over the 5 years ending 2008.

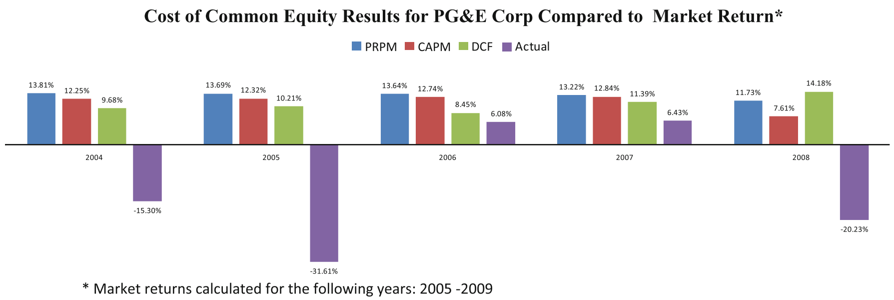
Figures 4–11 show the histograms of the cost of common equity capital estimations for each of the eight public utility stocks and the realized market returns in the forthcoming year. The consumption asset pricing model appears to track more consistently with the CAPM than with the DCF which seems to produce generally lower values than the other methods. The consumption asset pricing model results are similar to the CAPM. The model and the CAPM compete as the best predictor of the rate of return on the book value of common equity (not shown but available upon request), but none of the expected returns were good predictors of market returns. That does not infer that they were not good predictors of *expected* market returns. These results are an initial indicator that the consumption asset pricing model provides reasonable and stable results. This paper does not suggest at this early juncture that the consumption asset pricing model is superior to the CAPM or DCF, although it is based on far less restrictive assumptions than these other models. For example, both the DCF and CAPM assume that markets are efficient. Many assume that the DCF requires that the market-to-book ratio to always equal one, whereas the long-term value for the Standard and Poor's 500 is equal to 2.34. The CAPM assumes that investors demand higher returns for higher volatility and that the minimum required return is the risk-free rate, whereas the consumption asset pricing model allows for investors to require returns less than the risk-free rate for stocks that may have relatively higher volatility but are hedging assets that have desirable return fluctuation patterns that offset downturns in the business cycle. Unlike the CAPM, the model prices the risk to which investors are actually exposed, whether it's systematic risk or not. Some investors are diversified and some are not; the model prices whatever risk to which the aggregate of investors of the specific stock is exposed.

We find that the consumption asset pricing model should be used in combination with other cost of common equity pricing models as additional information in the devel-



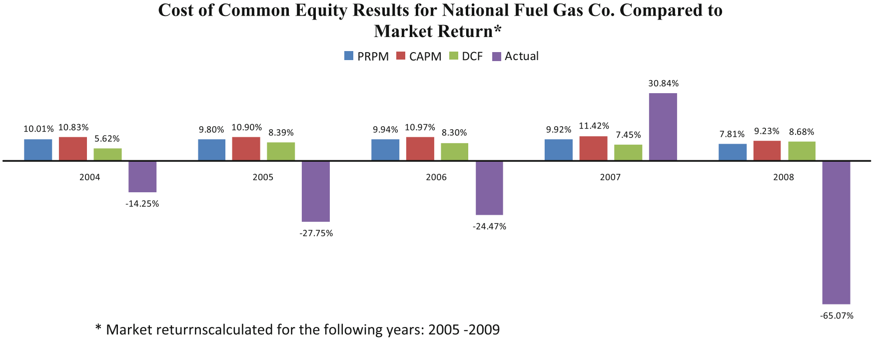


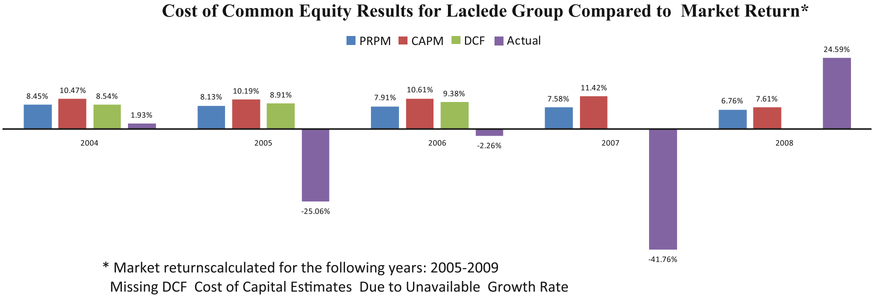


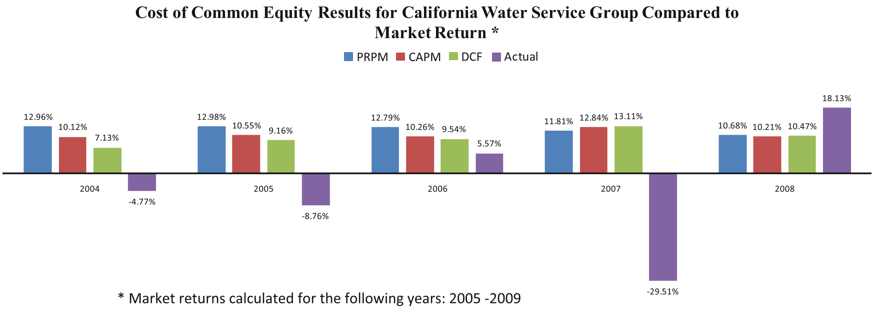


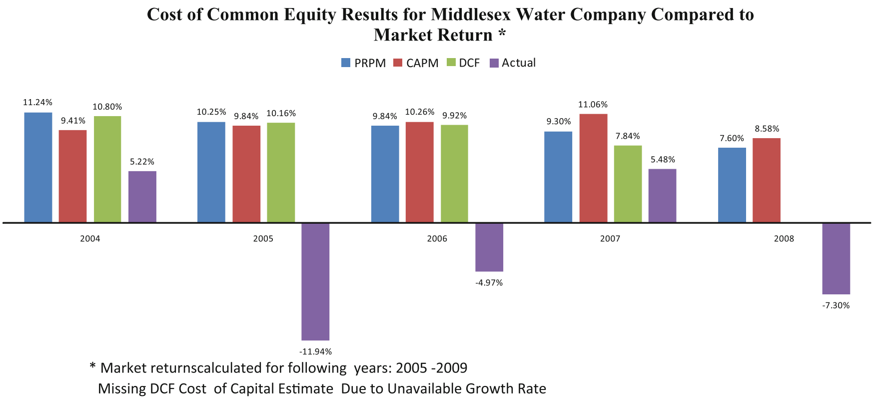
Figs. 4–11 Comparison of the cost of common equity estimates and market

opment of a cost of common equity capital recommendation. Practitioners may find the modeling methods and the use of relatively advanced econometric methods rather cumbersome. The software for performing these estimations is readily available from EViews© and SAS©; two commonly available software packages at utilities, consult-









Figs. 4–11 continued

ing firms and financial firms. Recent Ph.D. and M.S. holding members of research departments of investment and consulting firms have ready access to the model and methods discussed in this paper, although it will require years for these tools, like any "new" technology, to diffuse into standard use. Another problem is that the model requires a substantial time series history on stock returns data to develop stable estimates of risk premia This is problematic especially for the electric and gas utility industries that have consolidated with many mergers in the recent past. This problem can be addressed by developing and predicting the value-weighted risk premium of a portfolio of similar stocks such as electric utilities that have nuclear generating assets. The specific stock in question would be included in the returns index with a weight based on market capitalization that would go to 0 when the stock price history is no longer existent reaching back into the past.

5 Conclusion

The purpose of this paper is to introduce, test empirically and apply a general consumption based asset pricing model that is based on a minimum of assumptions and restrictions that can be used to predict the risk premium to be applied in estimating the cost of common equity for public utilities in regulatory proceedings. The results support the simple consumption-based asset pricing model that predicts the ex ante risk premium with a conditionally predicted volatility in risk premium. The estimates of the cost of common equity from the consumption asset pricing model compare well with rates of return on the book value of common equity and with the CAPM, although both the model and the CAPM results are substantially higher than the DCF. This is quite common in the practice of the cost of common equity in the utility industry. The results of the model are stable and consistent over time. Therefore the model should be considered as it provides additional evidence on the cost of common equity in general and specifically in public utility regulatory proceedings. Secondly, the use of bond-rated yields to predict risk differentiated equity-to-debt risk premia is supported by the empirical evidence and therefore should be applied in estimating the cost of common equity. Finally, the robust empirical evidence on the positive risk-return relationship also shows that utility stocks are not a consumption hedge and are not good hedging securities against contractions in the economy. The model and estimation methodology presented in this paper provide a relatively simple tool to determine whether any asset is a hedge to adverse changes in the business cycle through the level of consumption in the economy.

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Missouri-American Water Company
Correction of MIEC Witness Gorman's Constant Growth DCF Model to Reflect the Exclusion of Middlesex Water Company's DCF Results Due to its Negative EPS Growth Rate Forecast

	1	2	3	4	5
MIEC Witness Gorman's Proxy Group of Eight Water Companies	13- Week Average Stock Price (1)	Analysts' Growth (1)	Annualized Dividend (1)	Adjusted Dividend Yield (1)	Indicated Common Equity Cost Rate (2)
American States Water Co.	$ 33.95	9.58 %	$ 1.12	3.61 %	13.19 %
American Water Works Co., Inc.	29.04	9.55	0.92	3.47	13.02
Aqua America, Inc.	21.38	7.78	0.62	3.13	10.91
California Water Service Group	17.93	8.00	0.62	3.71	11.71
Connecticut Water Service, Inc.	26.17	8.00	0.95	3.93	11.93
Middlesex Water Company	17.74	(5.00)	0.73	3.92	NA (3)
SJW Corporation	22.57	14.00	0.69	3.49	17.49
York Water Company	16.87	6.00	0.52	3.29	9.29
Average					12.51 %
Median					11.93 %

NA= Not Available
NMF = Not Meaningful Figure

Notes:

(1) From Schedule MPG-5.
(2) Column 2 + column 4.
(3) Middlesex's DCF results are not applicable due to its negative EPS growth forecast.

Source of Information: Schedule MPG-5

Industry Title	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Change 2009 - 2010	Change 2001 - 2010
Value added (Millions of dollars)												
Gross domestic product	10,286,167	10,642,316	11,142,143	11,867,800	12,638,400	13,398,900	14,061,800	14,369,100	14,119,000	14,660,400	3.83%	4.73%
Private industries	9,010,772	9,289,346	9,706,821	10,360,100	11,052,500	11,731,100	12,301,900	12,514,000	12,196,500	12,696,500	4.10%	4.54%
Agriculture, forestry, fishing, and hunting	98,554	94,405	115,556	142,700	127,100	122,500	144,700	160,100	133,100	154,100	15.78%	6.26%
Farms	76,214	72,304	92,412	118,300	102,000	93,100	114,900	131,100	104,000	...		
Forestry, fishing, and related activities	22,340	22,101	23,144	24,500	25,100	29,400	29,800	29,000	29,200	...		
Mining	119,296	109,462	134,761	159,300	192,000	229,000	254,200	317,100	240,800	281,400	16.86%	15.10%
Oil and gas extraction	72,914	66,598	89,248	106,600	128,600	147,800	162,900	210,800	141,700	...		
Mining, except oil and gas	27,567	27,552	27,988	31,000	36,300	40,700	41,900	47,900	48,900	...		
Support activities for mining	18,815	15,312	17,525	21,700	27,200	40,500	49,400	58,400	50,200	...		
Utilities	177,579	180,973	191,852	208,000	205,700	236,200	248,800	262,600	268,100	275,700	2.83%	6.14%
Construction	490,525	494,328	515,929	554,400	611,700	651,100	657,200	623,400	537,500	505,600	-5.93%	0.34%
Manufacturing	1,343,930	1,355,537	1,374,012	1,482,700	1,568,000	1,651,500	1,698,900	1,647,600	1,584,800	1,717,500	8.37%	3.09%
Durable goods	758,754	767,751	766,154	822,000	877,600	923,100	942,800	927,300	867,200	961,200	10.84%	2.96%
Wood products	27,541	27,277	28,277	31,700	33,000	30,200	28,200	25,100	20,900	...		
Nonmetallic mineral products	40,714	41,446	40,479	42,700	45,300	45,400	44,400	39,400	38,200	...		
Primary metals	39,551	41,352	37,811	52,200	53,700	59,700	59,000	61,500	43,400	...		
Fabricated metal products	110,035	105,210	104,332	112,700	120,400	125,600	134,300	135,100	121,900	...		
Machinery	103,119	95,897	92,849	100,400	109,500	116,600	125,300	125,300	112,700	...		
Computer and electronic products	128,239	132,573	136,948	159,600	183,300	200,000	196,400	204,100	206,400	...		
Electrical equipment, appliances, and components	42,970	42,568	42,465	38,900	39,900	45,600	45,800	50,600	51,700	...		
Motor vehicles, bodies and trailers, and parts	107,684	121,309	125,550	117,600	112,600	107,600	103,400	81,100	78,200	...		
Other transportation equipment	69,575	67,349	65,092	67,200	76,000	81,500	92,400	95,700	90,700	...		
Furniture and related products	31,744	31,280	30,334	31,100	34,300	36,600	34,700	28,800	24,200	...		
Miscellaneous manufacturing	57,583	61,489	62,016	67,900	69,600	74,500	78,800	80,600	79,000	...		
Nondurable goods	585,176	587,786	607,858	660,600	690,400	728,400	756,100	720,300	717,600	756,300	5.39%	3.25%
Food and beverage and tobacco products	173,463	176,942	174,005	168,900	172,100	181,400	179,900	181,200	206,100	...		
Textile mills and textile product mills	25,282	24,094	19,410	26,800	23,500	21,200	21,700	22,400	17,600	...		
Apparel and leather and allied products	18,953	18,269	16,414	16,400	16,000	15,500	14,900	13,500	11,700	...		
Paper products	53,722	53,531	49,844	54,200	53,800	59,300	58,600	53,800	56,100	...		
Printing and related support activities	38,890	37,437	36,753	37,000	37,500	37,900	38,500	37,000	32,800	...		
Petroleum and coal products	59,698	44,927	77,499	106,300	139,300	140,000	149,700	151,900	120,000	...		
Chemical products	153,163	169,567	171,402	186,800	182,700	207,900	223,200	201,100	216,500	...		
Plastics and rubber products	62,005	63,018	62,532	64,300	65,600	65,100	69,500	59,400	56,700	...		
Wholesale trade	613,304	614,892	638,065	684,500	725,300	769,600	813,300	822,900	780,800	807,700	3.45%	3.52%
Retail trade	703,893	731,156	768,924	794,700	838,800	875,000	886,100	840,200	819,600	862,800	5.27%	2.51%
Transportation and warehousing	302,591	302,405	319,754	347,000	369,700	395,500	405,400	418,700	389,500	406,500	4.36%	3.82%
Air transportation	45,195	46,796	53,231	56,100	55,700	59,700	60,200	61,000	61,900	...		
Rail transportation	22,576	21,740	23,121	24,300	27,000	30,600	31,700	34,800	30,800	...		
Water transportation	8,233	7,409	8,336	8,700	9,300	12,400	13,500	14,800	14,300	...		
Truck transportation	97,801	97,196	101,997	110,200	118,900	125,300	127,000	124,700	113,100	...		
Transit and ground passenger transportation	18,447	19,198	19,641	20,900	21,200	22,600	24,000	23,400	23,400	...		
Pipeline transportation	14,700	10,340	10,227	11,500	10,400	11,300	12,400	16,200	12,000	...		
Other transportation and support activities	70,335	73,383	75,986	83,900	91,900	96,400	96,500	102,000	94,700	...		
Warehousing and storage	25,303	26,343	27,214	31,400	35,300	37,200	40,000	41,700	39,400	...		
Information	451,078	499,693	508,606	564,100	592,600	593,300	633,300	652,500	639,300	670,300	4.85%	5.40%
Publishing industries (includes software)	100,072	121,772	127,979	140,800	151,200	133,900	151,200	155,400	147,700	...		
Motion picture and sound recording industries	47,504	51,613	48,164	56,300	56,300	59,600	62,700	61,000	59,800	...		
Broadcasting and telecommunications	267,286	267,916	268,631	289,000	311,400	317,600	347,700	359,100	355,800	...		
Information and data processing services	36,215	58,393	63,831	78,000	73,600	82,100	71,700	77,000	76,000	...		
Finance, insurance, real estate, rental, and leasing	2,154,790	2,222,273	2,316,138	2,409,700	2,606,500	2,777,600	2,891,300	2,974,900	3,040,300	3,093,700	1.76%	4.84%
Finance and insurance	838,678	863,537	903,149	929,200	1,028,500	1,105,500	1,110,400	1,100,400	1,171,600	1,235,200	5.43%	5.25%
Federal Reserve banks, credit intermediation, and related activities	376,573	436,009	461,626	433,300	470,700	483,500	476,900	514,300	514,000	...		
Securities, commodity contracts, and investments	178,174	153,512	139,840	144,000	183,000	214,500	199,700	188,900	175,200	...		
Insurance carriers and related activities	260,391	248,565	272,985	319,600	337,500	367,400	392,400	350,900	424,500	...		
Funds, trusts, and other financial vehicles	23,540	25,451	28,697	32,400	37,300	40,200	41,500	46,300	57,800	...		
Real estate and rental and leasing	1,316,113	1,358,736	1,412,989	1,480,400	1,577,900	1,672,100	1,780,800	1,874,500	1,868,700	1,858,500	-0.55%	4.58%
Real estate	1,163,925	1,210,895	1,267,747	1,337,600	1,424,900	1,488,600	1,595,100	1,688,900	1,686,500	...		
Rental and leasing services and lessors of intangible assets	152,188	147,841	145,242	142,800	153,100	183,400	185,700	185,500	182,100	...		
Professional and business services	1,170,671	1,198,309	1,259,374	1,346,800	1,461,800	1,571,400	1,700,500	1,768,800	1,701,300	1,771,900	4.15%	5.71%
Professional, scientific, and technical services	701,126	718,942	745,479	810,500	875,600	952,200	1,028,700	1,093,600	1,068,500	1,103,900	3.31%	6.38%
Legal services	147,957	153,874	163,531	180,700	194,500	201,900	215,300	225,600	219,200	...		
Computer systems design and related services	116,245	109,835	109,653	117,700	129,300	144,300	160,900	170,600	169,600	...		
Miscellaneous professional, scientific, and technical services	436,924	455,234	472,295	512,100	551,800	606,000	652,500	697,400	679,700	...		
Management of companies and enterprises	174,551	178,324	192,219	203,100	217,700	234,300	257,300	260,100	246,500	256,300	3.98%	5.20%
Administrative and waste management services	294,995	301,044	321,676	333,200	368,500	385,000	414,500	415,100	386,300	411,800	6.60%	4.40%
Administrative and support services	266,163	270,403	287,870	299,000	331,300	350,400	375,700	374,100	347,600	...		
Waste management and remediation services	28,831	30,641	33,806	34,300	37,200	34,600	38,800	40,900	38,700	...		

Industry Title	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Change 2009 - 2010	Change 2001 - 2010
Value added (Millions of dollars)												
Educational services, health care, and social assistance	729,193	789,798	847,263	906,400	953,400	1,015,200	1,078,300	1,148,900	1,212,900	1,274,400	5.07%	8.31%
Educational services	88,692	98,855	106,063	116,000	120,100	128,700	137,300	147,000	154,900	162,600	4.97%	9.26%
Health care and social assistance	640,500	690,943	741,200	790,400	833,300	886,500	941,000	1,001,900	1,057,900	1,111,700	5.09%	8.17%
Ambulatory health care services	313,504	335,271	357,840	381,400	406,100	432,300	458,200	486,100	514,200	...		
Hospitals and nursing and residential care facilities	272,008	296,068	318,996	341,200	354,400	377,700	400,000	428,800	452,700	...		
Social assistance	54,989	59,605	64,363	67,800	72,800	76,400	82,900	87,000	91,000	...		
Arts, entertainment, recreation, accommodation, and food services	391,174	411,149	426,918	456,700	481,600	511,300	545,200	535,400	513,100	531,100	3.51%	3.97%
Arts, entertainment, and recreation	94,816	102,140	105,752	113,300	117,300	126,600	134,400	135,200	127,300	131,200	3.06%	4.26%
Performing arts, spectator sports, museums, and related activities	49,826	55,338	59,005	62,200	63,800	68,100	72,400	73,200	70,900	...		
Amusements, gambling, and recreation industries	44,990	46,802	46,747	51,100	53,500	58,400	62,000	62,000	56,400	...		
Accommodation and food services	296,358	309,010	321,166	343,400	364,300	384,700	410,800	400,200	385,800	399,900	3.65%	3.88%
Accommodation	91,314	92,764	93,791	100,600	108,700	113,600	123,200	118,100	108,700	...		
Food services and drinking places	205,044	216,246	227,376	242,800	255,600	271,100	287,600	282,100	277,100	...		
Other services, except government	264,193	284,966	289,672	303,000	318,500	332,000	344,600	340,900	335,400	343,800	2.50%	3.35%
Government	1,275,395	1,352,970	1,435,322	1,507,700	1,585,900	1,667,800	1,759,900	1,855,100	1,922,500	1,963,900	2.15%	6.00%
Federal	385,084	416,585	447,295	478,400	501,800	526,500	552,300	580,200	611,500	637,700	4.28%	7.29%
General government	324,936	351,840	382,921	412,000	438,700	460,600	486,000	517,100	551,700	...		
Government enterprises	60,148	64,745	64,374	66,400	63,100	65,900	66,200	63,100	59,900	...		
State and local	890,311	936,385	988,027	1,029,300	1,084,100	1,141,300	1,207,600	1,274,900	1,311,000	1,326,100	1.15%	5.44%
General government	814,699	859,593	909,258	947,300	997,700	1,051,300	1,118,600	1,180,500	1,208,500	...		
Government enterprises	75,612	76,792	78,769	81,900	86,400	90,000	89,100	94,400	102,500	...		
Addenda:												
Private goods-producing industries [2]	2,052,305	2,053,732	2,140,258	2,339,200	2,498,800	2,654,100	2,755,000	2,748,200	2,496,300	2,658,600	6.50%	3.28%
Private services-producing industries [3]	6,958,467	7,235,615	7,566,564	8,020,900	8,553,700	9,077,000	9,546,900	9,765,800	9,700,300	10,038,000	3.48%	4.92%
Information-communications-technology-producing industries [4]	380,771	422,572	438,412	496,200	537,400	560,300	580,200	607,100	599,800	684,100	14.05%	8.85%

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expectations relative to history, historical growth rates become suspect as a measure of investor expectations.

Yet another issue associated with historical growth is that reliance on history to measure investor expectations renders the replication of that growth a self-fulfilling prophecy. Reliance on forecast growth rates avoids this inherent circularity.

The major point of all this is that it is perilous to apply historical growth when a utility is in a transition between growth paths. When payout ratios, equity return, and market-to-book ratios are changing, reliance on historical growth is hazardous. Such transitions can occur under variable inflation environments, and under fundamental structural shifts, such as deregulation.

Given the choice of variables, length of historical period, and the choice of statistical methodologies, the number of permutations and combinations of historical growth rates is such that other methods and proxies for expected growth must be explored. Historical growth rates constitute a useful starting point and provide useful information as long as the necessary conditions and assumptions outlined in this section are not dramatically violated. Although historical information provides a primary foundation for expectations, investors use additional information to supplement past growth rates. Extrapolating past history alone without consideration of historical trends and anticipated economic events would assume either that past rates will persist over time or that investors' expectations are based entirely on history.

9.4 Growth Estimates: Analysts' Forecasts

Since investor growth expectations are the quantities desired in the DCF model, the use of forecast growth published by investment services merits serious consideration. The growth rates assumed by investors can be determined by a study of the analyses of future earnings and projected long-run growth rates made by the investment community. The anticipated long-run growth rates actually used by institutional investors to determine the desirability of investing in different securities influence investors' growth anticipations.

Typically, growth forecasts are in the form of earnings per share over periods ranging from one to 5 years, and are supported by extensive financial analysis.[10]

[10] Analysts do not generally disseminate their methods of forecasting and do not generally recommend the purchase or sale of a security based on any single growth variable or growth estimating technique. A professional financial analyst is reluctant to reveal the premises and methods of his professional judgment and recommendations. Moreover, analysts' buy/sell recommendations result from complex judgments that cannot be reduced to a single variable or to simple mechanistic equations or models. Several methods and algorithms, involving both quantitative and qualitative factors, are likely to be used in arriving at a final growth forecast, including historical indicators.

The average growth rate estimate from all the analysts that follow the company measures the consensus expectation of the investment community for that company. In most cases, it is necessary to use earnings forecasts rather than dividend forecasts due to the extreme scarcity of dividend forecasts compared to the widespread availability of earnings forecasts. Given the paucity and variability of dividend forecasts, using the latter would produce unreliable DCF results. In any event, the use of the DCF model prospectively assumes constant growth in both earnings and dividends. Moreover, as discussed below, there is an abundance of empirical research that shows the validity and superiority of earnings forecasts relative to historical estimates when estimating the cost of capital.

The uniformity of growth projections is a test of whether they are typical of the market as a whole. If, for example, 10 out of 15 analysts forecast growth in the 7%–9% range, the probability is high that their analysis reflects a degree of consensus in the market as a whole. As a side note, the lack of uniformity in growth projections is a reasonable indicator of higher risk. Chapter 3 alluded to divergence of opinion amongst analysts as a valid risk indicator.

Because of the dominance of institutional investors and their influence on individual investors, analysts' forecasts of long-run growth rates provide a sound basis for estimating required returns. Financial analysts exert a strong influence on the expectations of many investors who do not possess the resources to make their own forecasts, that is, they are a cause of g. The accuracy of these forecasts in the sense of whether they turn out to be correct is not at issue here, as long as they reflect widely held expectations. As long as the forecasts are typical and/or influential in that they are consistent with current stock price levels, they are relevant. The use of analysts' forecasts in the DCF model is sometimes denounced on the grounds that it is difficult to forecast earnings and dividends for only one year, let alone for longer time periods. This objection is unfounded, however, because it is present investor expectations that are being priced; it is the consensus forecast that is embedded in price and therefore in required return, and not the future as it will turn out to be.

Empirical Literature on Earnings Forecasts

Published studies in the academic literature demonstrate that growth forecasts made by security analysts represent an appropriate source of DCF growth rates, are reasonable indicators of investor expectations and are more accurate than forecasts based on historical growth. These studies show that investors rely on analysts' forecasts to a greater extent than on historic data only.

Academic research confirms the superiority of analysts' earnings forecasts over univariate time-series forecasts that rely on history. This latter category includes many *ad hoc* forecasts from statistical models, ranging from the naive methods of simple averages, moving averages, etc. to the sophisticated time-series techniques such as the Box-Jenkins modeling techniques. The literature suggests that analysts' earnings forecasts incorporate all the public information available to the analysts and the public at the time the forecasts are released. This finding implies that analysts have already factored historical growth trends into their forecast growth rates, making reliance on historical growth rates somewhat redundant and, at worst, potentially double counting growth rates which are irrelevant to future expectations. Furthermore, these forecasts are statistically more accurate than forecasts based solely on historical earnings, dividends, book value equity, and the like.

Summary of Empirical Research

Important papers include Brown and Rozeff (1978), Cragg and Malkiel (1968, 1982), Harris (1986), Vander Weide and Carleton (1988), Lys and Sohn (1990), and Easterwood and Nutt (1999).

The study by Brown and Rozeff (1978) shows that analysts, as proxied by Value Line analysts, make better forecasts than could be obtained using only historical data, because analysts have available not only past data but also a knowledge of such crucial factors as rate case decisions, construction programs, new products, cost data, and so on. Brown and Rozeff test the accuracy of analysts' forecasts versus forecasts based on past data only, and conclude that their evidence of superior analyses means that analysts' forecasts should be used in studies of cost of capital. Their evidence supports the hypothesis that Value Line analysts consistently make better predictions than historical time-series models.

Using the IBES consensus earnings forecasts as proxies for investor expectation, Harris (1986) estimates the cost of equity using expected rather than historical earnings growth rates. In his review of the literature on financial analysts' forecasts, Harris concludes that a growing body of knowledge shows that analysts' earnings forecasts are indeed reflected in stock prices. Elton, Gruber, and Gultekin (1981) show that stock prices react more to changes in analysts' forecasts of earnings than they do to changes in earnings themselves, suggesting the usefulness of analysts' forecasts as surrogates for market expectations. In an extensive National Bureau of Economic Research study using analysts' earnings forecasts, Cragg and Malkiel (1982) present detailed empirical evidence that the average analyst's expectation is more similar to expectations being reflected in the marketplace than historical growth rates, and that it is the best possible source of DCF growth rates. The authors show that historical growth rates do not contain any information that is not already impounded in analysts' growth forecasts. They conclude that the expectations formed by Wall Street professionals get quickly and thoroughly impounded into the prices of securities and that the company valuations made by analysts are reflected in security prices.

Vander Weide and Carleton (1988) update the Cragg and Malkiel study and find overwhelming evidence that the consensus analysts' forecasts of future growth is superior to historically oriented growth measures in predicting the firm's stock price. Their results also are consistent with the hypothesis that investors use analysts' forecasts, rather than historically oriented growth calculations, in making stock buy-and-sell decisions. A study by Timme and Eiseman (1989) produced similar results.

Using virtually all publicly available analyst earnings forecasts for a large sample of companies (over 23,000 individual forecasts by 100 analyst firms), Lys and Sohn (1990) show that stock returns respond to individual analyst earnings forecasts, even when they are closely preceded by earnings forecasts made by other analysts or by corporate accounting disclosures. Using actual and IBES data from 1982–1995, Easterwood and Nutt (1999) regress the analysts' forecast errors against either historical earnings changes or analysts' forecasting errors in the prior years. Results show that analysts tend to underreact to negative earnings information, but overreact to positive earnings information.

The more recent studies provide evidence that analysts make biased forecasts and misinterpret the impact of new information.[11] For example, several studies in the early 1990s suggest that analysts either systematically underreact or overreact to new information. Easterwood and Nutt (1999) discriminate between these different reactions and reported that analysts underreact to negative information, but overreact to positive information. The recent studies do not necessarily contradict the earlier literature. The earlier research focused on whether analysts' earnings forecasts are better at forecasting future earnings than historical averages, whereas the recent literature investigates whether the analysts' earnings forecasts are unbiased estimates of future earnings. It is possible that even if the analysts' forecasts are biased, they are still closer to future earnings than the historical averages, although this hypothesis has not been tested in the recent studies. One way to assess the concern that analysts' forecasts may be biased upward is to incorporate into the analysis the growth forecasts of independent research firms, such as Value Line, in addition to the analyst consensus forecast. Unlike investment banking firms and stock brokerage firms, independent research firms such as Value Line have no incentive to distort earnings growth estimates in order to bolster interest in common stocks.

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[11] Other relevant papers corroborating the superiority of analysts' forecasts as predictors of future returns versus historical growth rates include: Fried and Givoly (1982), Moyer, Chatfield and Kelley (1985), and Gordon, Gordon and Gould (1989).

Some argue that analysts tend to forecast earnings growth rates that exceed those actually achieved and that this optimism biases the DCF results upward. The magnitude of the optimism bias for large rate-regulated companies in stable segments of an industry is likely to be very small. Empirically, the severity of the optimism problem is unclear for regulated utilities, if a problem exists at all. It is interesting to note that Value Line forecasts for utility companies made by independent analysts with no incentive for over- or understating growth forecasts are not materially different from those published by analysts in security firms with incentives not based on forecast accuracy, and may in fact be more robust. If the optimism problem exists at all, it can be circumvented by relying on multiple-stage DCF models that substitute long-term economic growth for analysts' growth forecasts in the second and/ or third stages of the model.

Empirical studies have also been conducted showing that investors who rely primarily on data obtained from several large reputable investment research houses and security dealers obtain better results than those who do not.[12] Thus, both empirical research and common sense indicate that investors rely primarily on analysts' growth rate forecasts rather than on historical growth rates alone.

Ideally, one could decide which analysts make the most reliable forecasts and then confine the analysis to those forecasts. This would be impractical since reliable data on past forecasts are generally not available. Moreover, analysts with poor track records are replaced by more competent analysts, so that a poor forecasting record by a particular firm is not necessarily indicative of poor future forecasts. In any event, analysts working for large brokerage firms typically have a following, and investors who heed a particular analyst's recommendations do exert an influence on the market. So, an average of all the available forecasts from large reputable investment houses is likely to produce the best DCF growth rate.

Growth rate forecasts are available online from several sources. For example, Value Line Investment Analyzer, IBES (Institutional Brokers' Estimate System), Zacks Investment Research, Reuters, First Call, Yahoo Finance, and Multex Web sites provide analysts' earnings forecasts on a regular basis by reporting on the results of periodic (usually monthly) surveys of the earnings growth forecasts of a large number of investment advisors, brokerage houses, and other firms that engage in fundamental research on U.S. corporations. These firms include most large institutional investors, such as pension funds, banks, and insurance companies. Representative of industry practices, the Zacks Investment Research Web site is a central location whereby investors

[12] Examples of these studies include Stanley, Lewellen and Schlarbaum (1981) and Touche Ross Co. (1982).

are able to research the different analyst estimates for any given stock without necessarily searching for each individual analyst. Zacks gathers and compiles the different estimates made by stock analysts on the future earnings for the majority of U.S. publicly traded companies. Estimates of earnings per share for the upcoming 2 fiscal years, and a projected 5-year growth rate in such earnings per share are available at monthly intervals. The forecast 5-year growth rates are normalized in order to remove short-term distortions. Forecasts are updated when analysts formally change their stated predictions.

Exclusive reliance on a single analyst's growth forecast runs the risk of being unrepresentative of investors' consensus forecast. One would expect that averages of analysts' growth forecasts, such as those contained in IBES or Zacks, are more reliable estimates of investors' consensus expectations likely to be impounded in stock prices.[13] Averages of analysts' growth forecasts rather than a single analyst's growth forecasts are more reliable estimates of investors' consensus expectations.

One problem with the use of published analysts' forecasts is that some forecasts cover only the next one or two years. If these are abnormal years, they may not be indicative of longer-run average growth expectations. Another problem is that forecasts may not be available in sufficient quantities or may not be available at all for certain utilities, for example water utilities, in which case alternate methods of growth estimation must be employed.

Some financial economists are uncomfortable with the assumption that the DCF growth rates are perpetual growth rates, and argue that above average growth can be expected to prevail for a fixed number of years and then the growth rate will settle down to a steady-state, long-run level, consistent with that of the economy. The converse also can be true whereby below-average growth can be expected to prevail for a fixed number of years and then the growth rate will resume a higher steady-state, long-run level. Extended DCF models are available to accommodate such assumptions, and were discussed in Chapter 8.

Earnings versus Dividend Forecasts

Casual inspection of the Zacks Investment Research, First Call Thompson, and Multex Web sites reveals that earnings per share forecasts dominate the information provided. There are few, if any, dividend growth forecasts. Only Value Line provides comprehensive long-term dividend growth forecasts. The wide availability of earnings forecasts is not surprising. There is an abundance of evidence attesting to the importance of earnings in assessing investors'

[13] The earnings growth rates published by Zacks, First Call, Reuters, Value Line, and IBES contain significant overlap since all rely on virtually the same population of institutional analysts who provide such forecasts.

expectations. The sheer volume of earnings forecasts available from the investment community relative to the scarcity of dividend forecasts attests to their importance. The fact that these investment information providers focus on growth in earnings rather than growth in dividends indicates that the investment community regards earnings growth as a superior indicator of future long-term growth. Surveys of analytical techniques actually used by analysts reveal the dominance of earnings and conclude that earnings are considered far more important than dividends. Finally, Value Line's principal investment rating assigned to individual stocks, Timeliness Rank, is based primarily on earnings, accounting for 65% of the ranking.

Historical Growth Rates Versus Analysts' Forecasts

Obviously, historical growth rates as well as analysts' forecasts provide relevant information to the investor with regard to growth expectations. Each proxy for expected growth brings information to the judgment process from a different light. Neither proxy is without blemish; each has advantages and shortcomings. Historical growth rates are available and easily verifiable, but may no longer be applicable if structural shifts have occurred. Analysts' growth forecasts may be more relevant since they encompass both history and current changes, but are nevertheless imperfect proxies.

9.5 Growth Estimates: Sustainable Growth Method

The third method of estimating the growth component in the DCF model, alternately referred to as the ''sustainable growth'' or ''retention ratio'' method, can be used by investment analysts to predict future growth in earnings and dividends. In this method, the fraction of earnings expected to be retained by the company, b, is multiplied by the expected return on book equity, r, to produce the growth forecast. That is,

$$g = b \times r$$

The conceptual premise of the method, enunciated in Chapter 8, Section 8.4, is that future growth in dividends for existing equity can only occur if a portion of the overall return to investors is reinvested into the firm instead of being distributed as dividends.

For example, if a company earns 12% on equity, and pays all the earnings out in dividends, the retention factor, b, is zero and earnings per share will not grow for the simple reason that there are no increments to the asset base (rate base). Conversely, if the company retains all its earnings and pays no dividends, it would grow at an annual rate of 12%. Or again, if the company earns 12% on equity and pays out 60% of the earnings in dividends, the retention factor is 40%, and earnings growth will be 40% × 12% = 4.8% per year.

In implementing the method, both 'b' and 'r' should be the rate that the market expects to prevail in the future. If no explicit forecast of 'b' is available, it is reasonable to assume that the utility's future retention ratio will, on average, remain unchanged from its present level. Or, it can be estimated by taking a weighted average of past retention ratios as a proxy for the future on the grounds that utilities' target retention ratios are usually, although not always, stable.[14]

Both historical and forecast values of 'r' can be used to estimate g, although forecast values are superior. The use of historical realized book returns on equity rather than the expected return on equity is questionable since reliance on achieved results involves circular reasoning. Realized returns are the results of the regulatory process itself, and are also subject to tests of fairness and reasonableness. As a gauge of the expected return on book equity, either direct published analysts' forecasts of the long-run expected return on equity, or authorized rates of return in recent regulatory cases can be used as a guide. As a floor estimate, it seems reasonable for investors to expect allowed equity returns by state regulatory commissions to be in excess of the current cost of debt to the utility in question.

Another way of obtaining the expected 'r' is to examine its fundamental determinants. Since earnings per share, E, can be stated as dividends per share, D, divided by the payout ratio (1 − b), the earnings per share capitalized by investors can be inferred by dividing the current dividend by an expected payout ratio. Provided that a utility company follows a fairly stable dividend policy, the possibility of error is less when estimating the payout than when estimating the expected return on equity or the expected growth rate. Using this approach, and denoting book value per share by B, the expected return on equity is:

$$r = E/B = (D/(1 - b)) / B \tag{9-9}$$

Estimates of the expected payout ratio can be inferred from historical 10-year average payout ratio data for utilities, assuming a stable dividend policy has been pursued. Since individual averages frequently tend to regress toward the grand mean, the historical payout ratio needs to be adjusted for this tendency, using statistical techniques for predicting future values based on this tendency of individual values to regress toward the grand mean over time.

An application of the sustainable growth method is shown in example 9-1.

[14] Statistically superior predictions of future averages are made by weighting individual past averages with the grand mean, with the variance within the individual averages and the variance across individual averages serving as weights.

EXAMPLE 9-1

Southeastern Electric's sustainable growth rate is required for upcoming rate case testimony. As a gauge of the expected return on equity, authorized rates of return in recent decisions for eastern U.S. electric utilities as reported by Value Line for 2005 and 2006 averaged 11%, with a standard deviation of 1%. In other words, the majority of utilities were authorized to earn 11%, with the allowed return on equity ranging from 10% to 12%. As a gauge of the expected retention ratio, the average 2006 payout ratio of 34 eastern electric utilities as compiled by Value Line was 60%, which indicates an average retention ratio of 40%, with a standard deviation of 5%. This was consistent with the long-run target retention ratio indicated by the management of Southeastern Electric. It is therefore reasonable to postulate that investors expect a retention ratio ranging from 35% to 45% for the company with a likely value of 40%. In Table 9-4 below, expected retention ratios of 35% to 45% and assumed returns on equity from 10% to 12% are multiplied to produce sustainable growth rates ranging from 3.8% to 5.4% with a likely value of 4.6%.

TABLE 9-4
SUSTAINABLE GROWTH METHOD ILLUSTRATION

Expected Retention Ratio (b)	Expected Return on Book Equity (r)		
	10%	11%	12%
35%	3.5%	3.9%	4.2%
40%	4.0%	4.4%	4.8%
45%	4.5%	5.0%	5.4%

It should be pointed out that published forecasts of the expected return on equity by analysts such as Value Line are sometimes based on end-of-period book equity rather than on average book equity. The following formula[15]

[15] The return on year-end common equity, r, is defined as $r = E/B_t$, where E is earnings per share, and B_t is the year-end book value per share. The return on average common equity, r_a, is defined as: $r_a = E/B_a$ where B_a = average book value per share. The latter is by definition: $B_a = (B_t + B_{t-1})/2$ where B_t is the year-end book equity per share and B_{t-1} is the beginning-of-year book equity per share. Dividing r by r_a and substituting:

$$\frac{r}{r_a} = \frac{E/B_t}{E/B_a} = \frac{B_a}{B_t} + \frac{B_t + B_{t-1}}{2B_t}$$

Solving for r_a, a formula for translating the return on year-end equity into the return on average equity is obtained, using reported beginning-of-the year and end-of-year common equity figures:

$$r_a = r\frac{2B_t}{B_t + B_{t-1}}$$

adjusts the reported end-of-year values so that they are based on average common equity, which is the common regulatory practice:

$$r_a = r_t \frac{2B_t}{B_t + B_{t-1}} \qquad (9\text{-}10)$$

The sustainable growth method can also be extended to include external financing. From Chapter 8, the expanded growth estimate is given by:

$$g = br + sv$$

where b and r are defined as previously, s is the expected percent growth in number of shares to finance investment, and v is the profitability of the equity investment. The variable s measures the long-run expected stock financing that the utility will undertake. If the utility's investments are growing at a stable rate and if the earnings retention rate is also stable, then s will grow at a stable rate. The variable s can be estimated by taking a weighted average of past percentage increases in the number of shares. This measurement is difficult, however, owing to the sporadic and episodic nature of stock financing, and smoothing techniques must be employed. The variable v is the profitability of the equity investment and can be measured as the difference of market price and book value per share divided by the latter, as discussed in Chapter 8.

There are three problems in the practical application of the sustainable growth method. The first is that it may be even more difficult to estimate what b, r, s, and v investors have in mind than it is to estimate what g they envisage. It would appear far more economical and expeditious to use available growth forecasts and obtain g directly instead of relying on four individual forecasts of the determinants of such growth. It seems only logical that the measurement and forecasting errors inherent in using four different variables to predict growth far exceed the forecasting error inherent in a direct forecast of growth itself.

Second, there is a potential element of circularity in estimating g by a forecast of b and ROE for the utility being regulated, since ROE is determined in large part by regulation. To estimate what ROE resides in the minds of investors is equivalent to estimating the market's assessment of the outcome of regulatory hearings. Expected ROE is exactly what regulatory commissions set in determining an allowed rate of return. In other words, the method requires an estimate of return on equity before it can even be implemented. Common sense would dictate the inconsistency of a return on equity recommendation that is different than the expected ROE that the method assumes the utility will earn forever. For example, using an expected return on equity of 11% to determine the growth rate and using the growth rate to recommend a return on equity of 9% is inconsistent. It is not reasonable to assume that this regulated utility company is expected to earn 11% forever, but recommend a 9% return on equity. The only way this utility can earn 11% is that rates be set by the regulator so that the utility will in fact earn 11%. One is assuming, in effect, that the company will earn a return rate exceeding the recommended cost of equity forever, but then one is recommending that a different rate be granted by the regulator. In essence, using an ROE in the sustainable growth formula that differs from the final estimated cost of equity is asking the regulator to adopt two different returns.

The circularity problem is somewhat dampened by the self-correcting nature of the DCF model. If a high equity return is granted, the stock price will increase in response to the unanticipated favorable return allowance, lowering the dividend yield component of market return in compensation for the high g induced by the high allowed return. At the next regulatory hearing, more conservative forecasts of r would prevail. The impact on the dual components of the DCF formula, yield and growth, are at least partially offsetting.

Third, the empirical finance literature discussed earlier demonstrates that the sustainable growth method of determining growth is not as significantly correlated to measures of value, such as stock price and price/earnings ratios, as other historical growth measures or analysts' growth forecasts. Other proxies for growth, such as historical growth rates and analysts' growth forecasts, outperform retention growth estimates. See for example Timme and Eiseman (1989).

In summary, there are three proxies for the expected growth component of the DCF model: historical growth rates, analysts' forecasts, and the sustainable growth method. Criteria in choosing among the three proxies should include ease of use, ease of understanding, theoretical and mathematical correctness, and empirical validation. The latter two are crucial. The method should be logically valid and consistent, and should possess an adequate track record in predicting and explaining security value. The retention growth method is the weakest of the three proxies on both conceptual and empirical grounds. The research in this area has shown that the first two growth proxies do a better job of explaining variations in market valuation (M/B and P/E ratios) and are more highly correlated to measures of value than is the retention growth proxy.

Missouri-American Water Company
Market-to-Book Ratios, Earnings / Book Ratios and
Inflation for Standard & Poor's Industrial Index and
the Standard & Poor's 500 Composite Index

Schedule PMA-32

from 1947 through 2010

Year	Market-to-Book Ratio (1)		Earnings/ Book Ratio (2)			Earnings / Book Ratio - Net of Inflation	
	S&P Industrial Index (3)	S&P 500 Composite Index (3)	S&P Industrial Index (3)	S&P 500 Composite Index (3)	Inflation (4)		
1947	1.23	NA	13.0 %	NA	9.0 %	4.0 %	NA
1948	1.13	NA	17.3	NA	2.7	14.6	NA
1949	1.00	NA	16.3	NA	(1.8)	18.1	NA
1950	1.16	NA	18.3	NA	5.8	12.5	NA
1951	1.27	NA	14.4	NA	5.9	8.5	NA
1952	1.29	NA	12.7	NA	0.9	11.8	NA
1953	1.21	NA	12.7	NA	0.6	12.1	NA
1954	1.45	NA	13.5	NA	(0.5)	14.0	NA
1955	1.81	NA	16.0	NA	0.4	15.6	NA
1956	1.92	NA	13.7	NA	2.9	10.8	NA
1957	1.71	NA	12.5	NA	3.0	9.5	NA
1958	1.70	NA	9.8	NA	1.8	8.0	NA
1959	1.94	NA	11.2	NA	1.5	9.7	NA
1960	1.82	NA	10.3	NA	1.5	8.8	NA
1961	2.01	NA	9.8	NA	0.7	9.1	NA
1962	1.83	NA	10.9	NA	1.2	9.7	NA
1963	1.94	NA	11.4	NA	1.7	9.7	NA
1964	2.18	NA	12.3	NA	1.2	11.1	NA
1965	2.21	NA	13.2	NA	1.9	11.3	NA
1966	2.00	NA	13.2	NA	3.4	9.8	NA
1967	2.05	NA	12.1	NA	3.0	9.1	NA
1968	2.17	NA	12.6	NA	4.7	7.9	NA
1969	2.10	NA	12.1	NA	6.1	6.0	NA
1970	1.71	NA	10.4	NA	5.5	4.9	NA
1971	1.99	NA	11.2	NA	3.4	7.8	NA
1972	2.16	NA	12.0	NA	3.4	8.6	NA
1973	1.96	NA	14.6	NA	8.8	5.8	NA
1974	1.39	NA	14.8	NA	12.2	2.6	NA
1975	1.34	NA	12.3	NA	7.0	5.3	NA
1976	1.51	NA	14.5	NA	4.8	9.7	NA
1977	1.38	NA	14.6	NA	6.8	7.8	NA
1978	1.25	NA	15.3	NA	9.0	6.3	NA
1979	1.23	NA	17.2	NA	13.3	3.9	NA
1980	1.31	NA	15.6	NA	12.4	3.2	NA
1981	1.24	NA	14.9	NA	8.9	6.0	NA
1982	1.17	NA	11.3	NA	3.9	7.4	NA
1983	1.45	NA	12.2	NA	3.8	8.4	NA
1984	1.46	NA	14.6	NA	4.0	10.6	NA
1985	1.67	NA	12.2	NA	3.8	8.4	NA
1986	2.02	NA	11.5	NA	1.1	10.4	NA
1987	2.50	NA	15.7	NA	4.4	11.3	NA
1988	2.13	NA	19.0	NA	4.4	14.6	NA
1989	2.56	NA	18.5	NA	4.7	13.8	NA
1990	2.63	NA	16.3	NA	6.1	10.2	NA
1991	2.77	NA	10.8	NA	3.1	7.7	NA
1992	3.29	NA	13.0	NA	2.9	10.1	NA
1993	3.72	NA	15.7	NA	2.8	12.9	NA
1994	3.73	NA	23.0	NA	2.7	20.3	NA
1995	4.06	2.64	22.9	16.0 %	2.5	20.4	13.5 %
1996	4.79	3.00	24.8	16.8	3.3	21.5	13.5
1997	5.88	3.53	24.6	16.3	1.7	22.9	14.6
1998	7.13	4.16	21.3	14.5	1.6	19.7	12.9
1999	8.27	4.76	25.2	17.1	2.7	22.5	14.4
2000	7.51	4.51	23.9	16.2	3.4	20.5	12.8
2001	NA	3.50	NA	7.4	1.6	NA	5.8
2002	NA	2.93	NA	8.3	2.4	NA	5.9
2003	NA	2.78	NA	14.1	1.9	NA	12.2
2004	NA	2.91	NA	15.3	3.3	NA	12.0
2005	NA	2.78	NA	16.4	3.4	NA	13.0
2006	NA	2.75 (5)	NA	17.2	2.5	NA	14.7
2007	NA	2.77 (5)	NA	12.8	4.1	NA	8.7
2008	NA	2.02 (5)	NA	2.7	0.1	NA	2.6
2009	NA	1.63	NA	9.2	2.7	NA	6.5
2010	NA	1.92	NA	13.0	1.5	NA	11.5
Average	2.34	3.04	14.9 %	13.3 %	3.7 %	10.9 %	10.9 %

Notes: (1) Market-to-Book Ratio equals average of the high and low market price for the year divided by the average book value.

(2) Earnings/Book equals earnings per share for the year divided by the average book value.

(3) On January 2, 2001 Standard & Poor's released Global Industry Classification Standard (GICS) price indexes for all Standard & Poor's U.S. indexes. As a result, all S&P Indexes have been calculated with a common base of 100 at a start date of December 31, 1994. Also, the GICS industrial sector is not comparable to the former S&P Industrial Index and data for the former S&P Industrial Index has been discontinued.

(4) As measured by the Consumer Price Index (CPI).

(5) Ratios for 2006 / 2007 are based upon estimated book values using the actual average price and the estimated book value calculated by adding the 2006 earnings per share to the 2005 / 2006 book value per share and then subtracting the 2006 / 2007 dividends per share as provided by Standard & Poor's Statistical Record - Current Statistics, March 2008, p. 29.

Source of Information: Standard & Poor's Security Price Index Record, 2000 Edition, p. 40
Standard & Poor's Statistical Service, Current Statistics, August 2001, p. 29
Standard & Poor's Statistical Service, Current Statistics, January 2001, p. 36
Standard & Poor's Current Statistics, June 2006, p. 29.
Standard & Poor's Current Statistics, August 2007, p. 29.
Standard & Poor's Compustat Services, Inc. PC Plus Research Insight Database
Ibbotson SBBI 2011 Valuation Yearbook

Missouri-American Water Company
Indicated Common Equity Cost Rate Through Use of a Risk Premium Model Using an Adjusted Total Market Approach

Line No.		MIEC Witness Gorman's Proxy Group of Eight 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 (4)	5.71
7.	Risk Premium Derived Common Equity Cost Rate	10.61 %

Notes:
(1) Derived in Note (4) on page 4 of this Schedule.
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.35% from page 2 of this Schedule.
(3) Adjustment to reflect the A3 Moody's Bond Rating of the MIEC Witness Gorman's Proxy Group of Eight Water Companies as shown on page 2 of this Schedule. The 18 basis point adjustment is derived by taking 1/3 of the spread between Baa and A Public Utility Bonds (1/3 * 0.53% = 0.177%, rounded to 0.18%).

(4) From page 3 of this Schedule.

Missouri-American Water Company
Moody's and Standard & Poor's Bond Ratings for
MIEC Witness Gorman's Proxy Group of Eight Water Companies

	Moody's Bond Rating October 2011		Standard & Poor's Bond Rating October 2011	
MIEC Witness Gorman's Proxy Group of Eight Water Companies	Bond Rating	Numerical Weighting (1)	Bond Rating	Numerical Weighting (1)
American States Water Co. (3)	A2	6.0	A+	5.0
American Water Works Co., Inc. (4)	Baa1	8.0	A+	5.0
Aqua America, Inc. (5)	NR	- -	AA-	4.0
California Water Service Group (6)	NR	- -	AA-	4.0
Connecticut Water Service, Inc. (7)	NR	- -	A	6.0
Middlesex Water Company	NR	- -	A	6.0
SJW Corporation (8)	NR	- -	A	6.0
York Water Company	NR	- -	A-	7.0
Average	A3	7.0	A+	5.4

Notes: (1) From page 3 of Schedule PMA-10.
(2) Ratings, business risk and financial risk profiles are those of Golden State Water Company.
(3) Rating, business risk and financial risk profiles are those of Pennsylvania and New Jersey American Water.
(4) Ratings, business risk and financial risk profiles are those of Aqua Pennsylvania, Inc.
(5) Ratings, business risk and financial risk profiles are those of California Water Service Co.
(6) Ratings, business risk and financial risk profiles are those of Connecticut Water Company.
(7) Ratings, business risk and financial risk profiles are those of San Jose Water Co.
(8) Ratings, business risk and financial risk profiles are those of Laclede Gas Company.

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)

	Corporate Bonds	Public Utility Bonds			Spread - Corporate v. Public Utility Bonds			Spread - Public Utility Bonds	
Months	Aaa Rated	Aa Rated	A Rated	Baa Rated	Aa (Pub. Util.) over Aaa (Corp.)	A (Pub. Util.) over Aaa (Corp.)	Baa (Pub. Util.) over Aaa (Corp.)	A over Aa	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

Missouri-American Water Company
Judgment of Equity Risk Premium for
the MIEC Witness Gorman's Proxy Group of Eight Water Companies
d MIEC Witness Gorman's Proxy Group of Ten Natural Gas Distribution Compani

Line No.		Gorman's Proxy Group of Eight Water Companies
1.	Calculated equity risk premium based on the total market using the beta approach (1)	7.30
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	5.71 %

Notes: (1) From page 4 of this Schedule.
(2) From page 6 of this Schedule.

Missouri-American Water Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
the MIEC Witness Gorman's Proxy Group of Eight Water Companies
and MIEC Witness Gorman's Proxy Group of Ten Natural Gas Distribution Companies

Line No.		MIEC Witness Gorman's Proxy Group of Eight 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)	0.74
9.	Beta Adjusted Equity Risk Premium	7.30 %

Notes:
(1) Stocks, Bonds, Bills, and Inflation - Market Results for 1926-2010 Yearbook Valuation Edition, Morningstar, Inc., 2011 Chicago, IL.
(2) From Moody's Industrial Manual and Mergent Bond Record Monthly Update.
(3) The projected 3-5 year return of the market as calculated by the 13 week average market appreciation potential plus dividend yield published by Value Line ended October 21, 2011. The forecasted 3-5 year total annual market return is 18.29%. (15.99% + 2.30% = 18.29%)
(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 5 of this Schedule). 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 =
(6) From Line 3 of MPG-16, page 1.

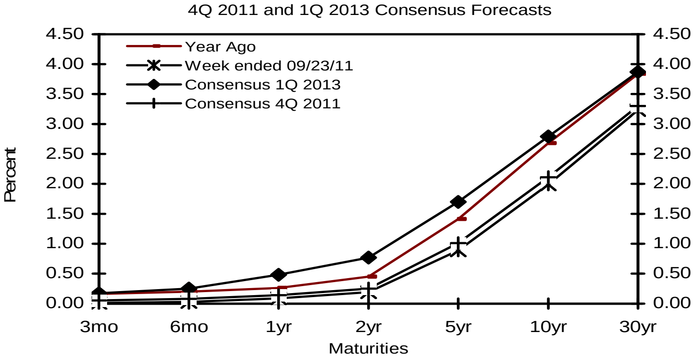
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			*Latest Q**	4Q	1Q	2Q	3Q	4Q	1Q
Interest Rates	Sep. 23	Sep. 16	Sep. 9	Sep. 2	Aug.	July	June	*3Q 2011*	**2011**	**2012**	**2012**	**2012**	**2012**	**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**
	History								Consensus Forecasts-Quarterly					
	4Q	1Q	2Q	3Q	4Q	1Q	2Q	*3Q**	**4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**
Key Assumptions	2009	2010	2010	2010	2010	2011	2011	*2011*	**2011**	**2012**	**2012**	**2012**	**2012**	**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**

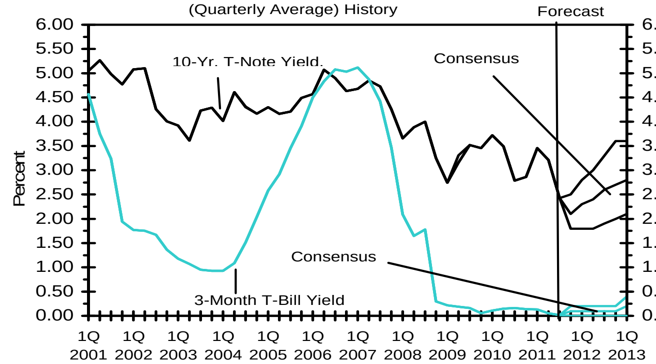
Forecasts for interest rates and the Federal Reserve's Major Currency Index represent averages for the quarter. Forecasts for Real GDP, GDP Price Index and Consumer Price Index are seasonally-adjusted annual rates of change (saar). Individual panel members' forecasts are on pages 4 through 9. Historical 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)***.

U.S. Treasury Yield Curve

Week ended September 23, 2011 and Year Ago vs.
4Q 2011 and 1Q 2013 Consensus Forecasts

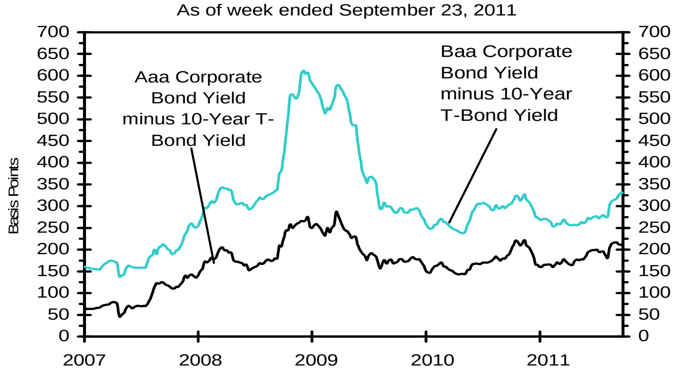


U.S. 3-Mo. T-Bills & 10-Yr. T-Note Yield



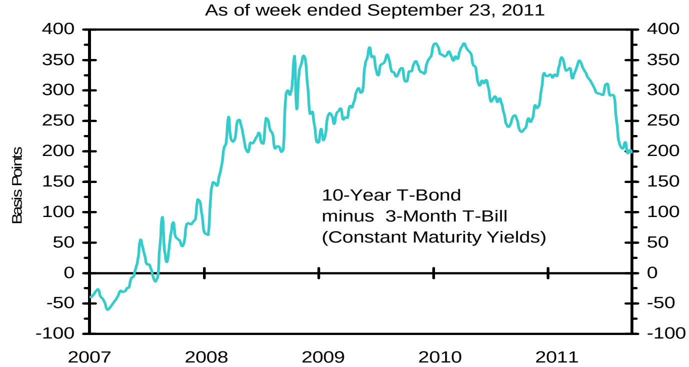
Corporate Bond Spreads

As of week ended September 23, 2011



U.S. Treasury Yield Curve

As of week ended September 23, 2011



Missouri-American Water Company
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.

Missouri-American Water Company
Correction to MIEC Witness Gorman's CAPM Analysis which Includes Consideration of Forward-Looking Market Returns
and the Utilization of the Empirical Capital Asset Pricing Model (ECAPM)

	1	2	3	4	5	6
	Value Line Adjusted Beta (1)	Market Risk Premium (2)	Risk-Free Rate (3)	Traditional CAPM Cost Rate (4)	ECAPM Cost Rate (5)	Indicated Common Equity Cost Rate (6)
MIEC Witness Gorman's Proxy Group of Eight Water Companies	0.74	10.55 %	3.90 %	11.71 %	12.39 %	12.05 %

Notes
(1) From Line 3 of Schedule MPG-16, page 1.
(2) Average of the Ibbotson long-term arithmetic mean risk premium of 6.70% and the projected 3-5 year return of the market as calculated by the 13 week average market appreciation potential published by Value Line ended October 21, 2011 minus MIEC Witness Gorman's projected risk-free rate. The average risk premium is 10.55%. ((6.70% + 14.39%) / 2 = 10.55%)
(3) From Line 1 of MPG-16, page 1.
(4) Calculated as shown on page 2 of Schedule PMA-12, note 3.
(5) Calculated as shown on page 2 of Schedule PMA-12, note 4.
(6) Average of Columns 4 and 5.

Missouri-American Water Company
Brief Summary of MIEC Witness Gorman's Corrected Common Equity Cost Rate

No.	Principal Methods	MIEC Witness Gorman's Proxy Group of Eight Water Companies	
1.	Discounted Cash Flow Model (DCF) (1)	11.93	%
2.	Risk Premium Model (RPM) (2)	10.61	
3.	Capital Asset Pricing Model (CAPM) (3)	12.05	
4.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	11.53	%
5.	Flotation Cost Adjustment (4)	0.16	
6.	Financial Risk Adjustment (5)	(0.21)	
7	Business Risk Adjustment (6)	0.40	
8.	Indicated Common Equity Cost Rate	11.88	%
9.	Recommended Common Equity Cost Rate	11.90	%

Notes:
(1) From Schedule PMA-29
(2) From Schedule PMA-33
(3) From Schedule PMA-34
(4) From Ms. Ahern's electronic workpapers.
(5) Financial risk adjustment to reflect the financial risk of the capital structure employed by Missouri-American Water Company for rate making purposes relative to the MIEC Witness Gorman's proxy group as detailed in Ms. Ahern's accompanying rebuttal testimony.
(6) Business risk adjustment to reflect Missouri-American Water Company's greater business risk due to its small size relative to MIEC Witness Gorman's proxy group as detailed in Ms. Ahern's accompanying rebuttal testimony.

Missouri-American Water Company
Correction of BJC Witness LaConte's DCF Analysis

Estimated ROE Single Stage DCF with Analyst Growth Rates

Utility	Close 8/2011-11/2011 Avg. Stock Price	2011 Dividend	Div. Yield	Analysts' Estimated Growth Rates: Value Line	Reuters	Yahoo Finance	Average	RoE
American States Water	34.04	1.10	3.2%	5.50%	7.15%	7.15%	6.60%	9.8%
American Water Works	29.63	0.91	3.1%	9.50%	11.09%	8.03%	9.54%	12.6%
Aqua America	21.59	0.62	2.9%	10.50%	7.60%	6.67%	8.26%	11.1%
Artesian Resources Corp.	17.91	0.79	4.4%	3.60%	5.00%	4.00%	4.20%	8.6%
California Water	17.68	0.62	3.5%	6.00%	7.00%	15.00%	9.33%	12.8%
Connecticut Water Service	22.62	0.93	4.1%	4.00%	5.50%	3.00%	4.17%	8.3%
Middlesex Water	17.52	0.73	4.2%	6.00%	-5.00%	3.00%	4.50% (1)	8.7%
SJW Corporation	26.27	0.69	2.6%	7.50%	n/a	14.00%	10.75%	13.4%
York Water Company	16.85	0.52	3.1%	6.00%	6.00%	6.00%	6.00%	9.1%
Average								10.5%
Median								9.8%

Notes:
(1) The average projected EPS growth rate for Middlesex Water Company does not include the negative 5% reported by Reuters.

Sourceof Information: Schedule BSL-1.

Missouri-American Water Company
Correction to BJC Witness LaConte's CAPM Analysis which Includes Consideration of Forward-Looking Market Returns
and the Utilization of the Empirical Capital Asset Pricing Model (ECAPM)

	1	2	3	4	5	6
	Value Line Adjusted Beta (1)	Market Risk Premium (2)	Risk-Free Rate (3)	Traditional CAPM Cost Rate (4)	ECAPM Cost Rate (5)	Indicated Common Equity Cost Rate (6)
BJC Witness LaConte's Proxy Group of Nine Water Companies	0.72	10.65 %	4.38 %	12.05 %	12.79 %	12.42 %

Notes
(1) From Line 10 of Schedule BSL-4.
(2) Average of the Ibbotson long-term arithmetic mean risk premium of 6.70% and the projected 3-5 year return of the market as calculated by the 13 week average market appreciation potential published by Value Line ended November 11, 2011 minus BJC Witness LaConte's projected risk-free rate. The average risk premium is 10.65%. ((6.70% + 14.60%) / 2 = 10.65%)
(3) From Line 15 of Schedule BSL-4.
(4) Calculated as shown on page 2 of Schedule PMA-12, note 3.
(5) Calculated as shown on page 2 of Schedule PMA-12, note 4.
(6) Average of Columns 4 and 5.

Missouri-American Water Company
Brief Summary of Corrected Common Equity Cost Rate

No.	Principal Methods	BJC Witness LaConte's Proxy Group of Nine Water Companies	
1.	Discounted Cash Flow Model (DCF) (1)	10.49	%
3.	Capital Asset Pricing Model (CAPM) (2)	12.42	
4.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	11.46	%
5.	Flotation Cost Adjustment (3)	0.16	
6.	Financial Risk Adjustment (4)	(0.21)	
7	Business Risk Adjustment (5)	0.40	
8.	Indicated Common Equity Cost Rate	11.80	%

Notes: (1) From Schedule PMA-36.
(2) From Schedule PMA-37.
(3) From Ms. Ahern's electronic workpapers.
(4) Financial risk adjustment to reflect the financial risk of the capital structure employed by Missouri-American Water Company for rate making purposes relative to the proxy group as detailed in Ms. Ahern's direct testimony.
(5) Business risk adjustment to reflect Missouri-American Water Company's greater business risk due to its small size relative to the proxy group as detailed in Ms. Ahern's direct testimony.

Missouri-American Water Company
Summary of Cost of Capital and Fair Rate of Return
Based upon the Estimated Capital Structure at December 31, 2011

Type of Capital	Amounts (1)	Ratios (1)	Cost Rate	Weighted Cost Rate
Long-Term Debt	$ 423,295,622	49.18%	6.28% (2)	3.09%
Preferred Equity	$ 2,223,468	0.26%	9.35% (2)	0.02%
Common Equity	$ 435,252,472	50.57%	11.85% (3)	5.99%
Total	$ 860,771,562	100.01% *		9.10%

* does not add due to rounding

Notes:
(1) Company-Provided.
(2) From pages 3 and 4 of this Schedule.
(2) Based upon informed judgment from the entire study, the principal results of which are summarized on page 2 of this Schedule.

Missouri-American Water Company
Brief Summary of Common Equity Cost Rate

No.	Principal Methods	Proxy Group of Nine Water Companies
1.	Discounted Cash Flow Model (DCF) (1)	11.45 %
2.	Risk Premium Model (RPM) (2)	10.34
3.	Capital Asset Pricing Model (CAPM) (3)	11.22
4.	Market Models Applied to Comparable Risk, Non-Price Regulated Companies (4)	13.21
5.	Indicated Common Equity Cost Rate before Adjustment for Business Risks	11.50 %
6.	Financial Risk Adjustment (5)	(0.21)
7.	Flotation Cost Adjustment (6)	0.16
8.	Business Risk Adjustment (7)	0.40
9.	Indicated Common Equity Cost Rate	11.85 %
10.	Recommended Common Equity Cost Rate	11.85 %

Notes:
(1) From page 5 of this Schedule.
(2) From page 15 of this Schedule.
(3) From page 21 of this Schedule.
(4) From page 23 of this Schedule
(5) Financial risk adjustment to reflect the financial risk of the capital structure employed by Missouri-American Water Company for rate making purposes relative to the proxy group as detailed in Ms. Ahern's direct testimony.
(6) From page 33 of this Schedule
(7) Business risk adjustment to reflect Missouri-American Water Company's greater business risk relative to the proxy group as detailed in Ms. Ahern's direct testimony.

Missouri-American Water Company
Cost of Long-Term Debt
at December 31, 2011

Column No.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Coupon Rate	Issuance Date	Maturity Date	Principal Amount	Amount Outstanding at 12/31/10	Pro Forma Adjustments	Pro Forma Amount Outstanding at 12/31/10	Unamortized Issuance Expense at 12/31/10	Pro Forma Adjustments	Monthly Amortization Debt Expense	Pro Forma Unamortized Issuance Expense at 12/31/10	Pro Forma Carrying Value at 12/31/10 (1)	Annual Amortization Debt Expense (2)	Annual Interest Expense (3)	Total Cost (4)
7.790%	06/01/97	06/01/27	8,000,000	8,000,000		8,000,000	62,379		317	58,579	7,941,421	3,800	623,200	$ 627,000
8.580%	04/21/95	03/01/25	3,000,000	3,000,000		3,000,000	36,757		216	34,163	2,965,837	2,595	257,400	259,995
7.140%	03/16/94	03/01/34	12,500,000	12,500,000		12,500,000	193,959		698	185,587	12,314,413	8,372	892,500	900,872
5.500%	05/18/93	01/01/23	4,950,000	-		-	155,768		1,082	142,787	(142,787)	12,981	-	12,981
5.000%	02/01/98	02/01/28	4,500,000	4,455,000		4,440,000	202,109		986	190,278	4,249,722	11,831	222,000	233,831
5.850%	07/26/96	07/01/26	6,000,000	-		-	230,771		1,241	215,882	(215,882)	14,889	-	14,889
5.000%	11/01/98	11/30/28	19,000,000	18,405,000		18,270,000	748,814		3,499	706,824	17,563,176	41,990	913,500	955,490
5.900%	03/01/00	03/01/30	29,000,000	28,820,000		28,795,000	947,213		4,118	897,794	27,897,206	49,420	1,698,905	1,748,325
5.200%	04/01/02	04/01/32	15,000,000	14,810,000		14,775,000	638,786		2,505	608,726	14,166,274	30,061		30,061
4.600%	12/20/06	12/01/36	57,480,000	57,480,000		57,480,000	1,318,915		4,241	1,268,025	56,211,975	50,891	2,644,080	2,694,971
6.593%	10/22/07	10/15/37	103,000,000	103,000,000		103,000,000	928,462		2,883	893,861	102,106,139	34,601	6,790,790	6,825,391
6.550%	8/1/08 (5)	05/31/23	70,000,000	70,000,000		70,000,000	217,961		1,463	200,407	69,799,593	17,554	4,585,000	4,602,554
8.250%	02/04/09	12/01/38	25,000,000	24,951,000		24,949,333	930,162		2,777	896,843	24,052,490	33,319	2,058,320	2,091,639
5.050%	11/21/11	10/15/37	25,000,000			25,000,000			-	-	25,000,000	-	1,262,500	1,262,500
			-	-		-	539,125		2,375	510,625	(510,625)	28,500	-	28,500
			-	-		-	667,678		5,518	601,462	(601,462)	66,216	-	66,216
			-	-		-	721,259		5,423	656,183	(656,183)	65,076	-	65,076
5.500%	02/01/93	02/01/23	15,000,000			-	314,207		2,167	288,204	(288,204)	26,003	-	26,003
5.700%	06/01/95	06/01/25	12,000,000			-	284,499		1,645	264,765	(264,765)	19,734	-	19,734
5.500%	11/01/96	11/01/26	19,900,000			-	502,757		2,646	471,004	(471,004)	31,753	-	31,753
5.100%	03/01/98	03/01/28	25,000,000	24,660,000		24,630,000	580,770		2,819	546,939	24,083,061	33,831	1,256,130	1,289,961
5.000%	03/01/99	03/01/29	40,000,000	39,195,000		39,040,000	999,810		4,586	944,774	38,095,226	55,035	1,952,000	2,007,035
			$ 494,330,000	$ 409,276,000	$ -	$ 433,879,333	$ 11,222,162	$ -	$ 53,204	$ 10,583,711	$ 423,295,622	$ 638,451	$ 25,156,325	$ 25,794,775
														6.09% (6)

Notes:

(1) Column 7 - Column 11.
(2) Column 10 x 12.
(3) Column 7 x Column 1.
(4) Column 14 + Column 15.
(5) Original issue date was 5/15/08 and held by AWK awaiting Board Approval until 8/1/08.
(6) Cost of Long-Term Debt = [Total Cost / Carrying Value].

Source of Information: Company-Provided

Missouri-American Water Company
Pro Forma Cost of Preferred Stock
at December 31, 2011

Column No.

Type, Par Value	1 Dividend Rate	2 Date Issued	3 Amount Outstanding at 12/31/11	4 Adjustments	5 Amount Outstanding at 12/31/11	6 Unamortized Issuance Expense at 12/31/11	7 Adjustments	8 Pro Forma Unamortized Issuance Expense at 12/31/11	9 Pro Forma Carrying Value at 12/31/11 (1)	10 Annual Amortization	11 Annual Dividends	12 Total Annual Cost (2)
Cumulative Preferred Stock $100 Par Value	5.875%	10/11/66	$ 96,000	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Preference Stock $100 Par Value	9.18%	10/3/91	2,500,000	(250,000)	2,250,000	27,954	(1,422)	26,532	2,223,468	1,422	206,550	207,972
Total Preferred Stock			$ 2,596,000	$ (250,000)	$ 2,250,000	$ 27,954	$ (1,422)	$ 26,532	$ 2,223,468	$ 1,422	$ 206,550	$ 207,972
												9.35% (3)

Notes:
(1) Column 5 - Column 8.
(2) Column 10 + Column 11.
(3) Total Cost of Preferred Stock = [Total Annual Cost/Carrying Value].

Source of Information: Company-Provided

Missouri-American Water Company
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.	3.22 %	5.50 %	7.50 %	12.00 %	7.57 %	8.14 %	3.35 %	11.49 %
American Water Works Co., Inc.	3.00	9.50	11.00	7.80	8.58	9.22	3.14	12.36
Aqua America, Inc.	2.86	10.50	7.80	8.30	7.28	8.47	2.98	11.45
Artesian Resources Corp.	4.18	NA	4.90	-	4.40	4.65	4.28	8.93
California Water Service Group	3.38	6.00	9.80	10.00	12.40	9.55	3.54	13.09
Connecticut Water Service, Inc.	3.52	NA	5.70	-	4.55	5.13	3.61	8.74
Middlesex Water Company	4.02	6.00	(1.00)	-	2.70	2.57	4.07	6.64
SJW Corporation	2.92	7.50	N/A	-	14.00	10.75	3.08	13.83
York Water Company	3.09	NA	5.60	-	4.90	5.25	3.17	8.42
Average								10.55 %
Median								11.45 %

NA= Not Available
NMF = Not Meaningful Figure

Notes:

(1) Indicated dividend at 1/3/2011 divided by the average closing price of the last 60 trading days ending 12/30/2011 for each company.
(2) From pages 6 through 14 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. , 3.22% x (1+(1/2 x 8.14%)) = 3.35%.
(5) Column 6 + column 7.

Source of Information:

Value Line Investment Survey: October 21, 2011
www.reuters.com Downloaded on 01/03/2012
www.zacks.com Downloaded on 01/03/2012
www.yahoo.com Downloaded on 01/03/2012

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)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
High:	25.3	26.4	29.0	29.0	26.8	34.6	43.8	46.1	42.0	38.8	39.6	36.4
Low:	16.7	19.0	20.3	21.6	20.8	24.3	30.3	33.6	27.0	29.8	31.2	30.5

Target Price Range 2014 | 2015 | 2016

2014-16 PROJECTIONS

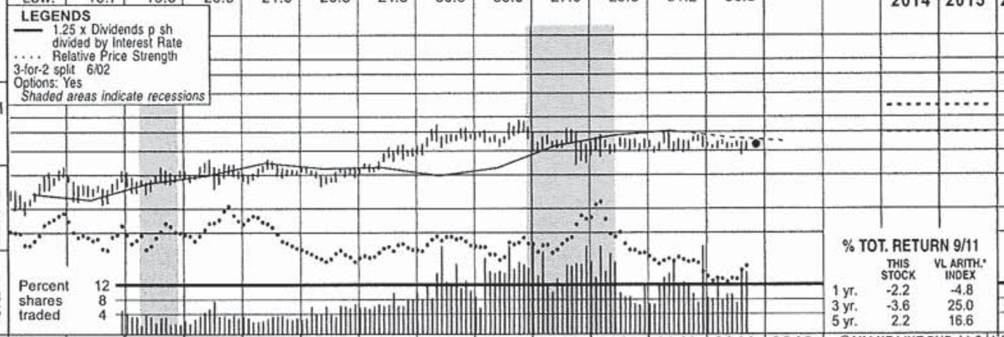
	Price	Gain	Ann'l Total Return
High	55	(+60%)	15%
Low	40	(+15%)	7%

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



% TOT. RETURN 9/11

	THIS STOCK	VL ARITH.* INDEX
1 yr.	-2.2	-4.8
3 yr.	-3.6	25.0
5 yr.	2.2	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
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*		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	*Value Line*		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%	*estimates*		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%*

Cal-endar	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*

Cal-endar	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*

Cal-endar	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)

	2008	2009	2010	2011
High:	23.7	23.0	25.8	31.0
Low:	16.5	16.2	19.4	25.2

2014-16 PROJECTIONS

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

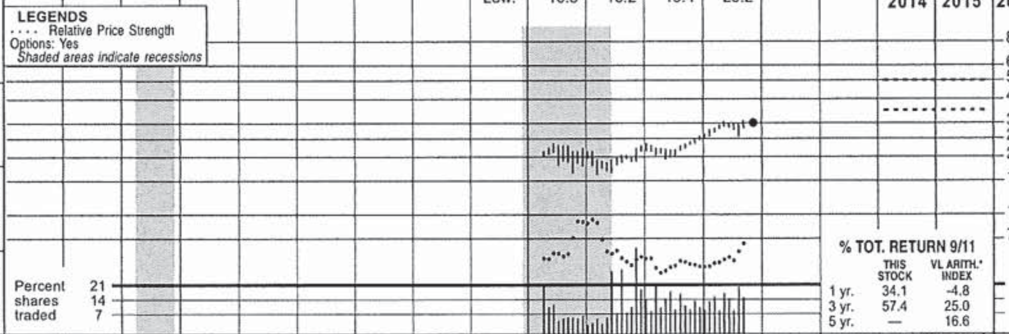
Insider Decisions

	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

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



% 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		Avg Ann'l P/E Ratio	19.0
--	--	--	--	--	--	--	--	--	--	--	--	--	1.14	1.04	.94	Value Line		Relative P/E Ratio	1.25
--	--	--	--	--	--	--	--	--	--	--	--	--	1.9%	4.2%	3.8%	estimates		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

Cal-endar	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

Cal-endar	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

Cal-endar	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

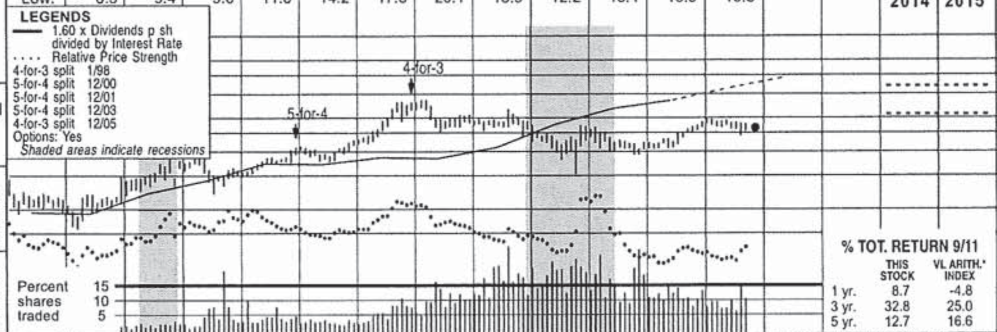
	N	D	J	F	M	A	M	J	J
to Buy	0	0	0	0	0	0	0	0	0
Options	0	1	1	0	1	0	0	0	0
to Sell	1	1	0	0	1	0	0	0	0

Institutional Decisions

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

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
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

Target Price Range 2014 | 2015 | 2016



% 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		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	Value Line		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%	estimates		Avg Ann'l Div'd Yield	2.7%

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		14-16
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	2495.5	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%

Cal-endar	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

Cal-endar	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

Cal-endar	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

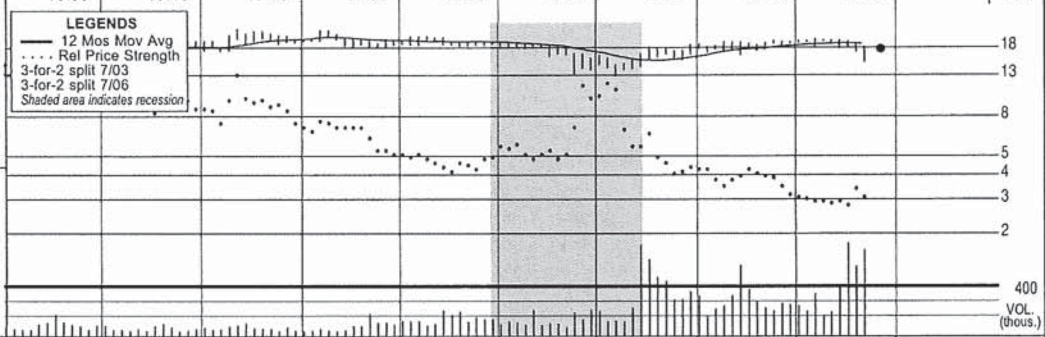
RECENT PRICE	TRAILING P/E RATIO	RELATIVE P/E RATIO	DIV'D YLD	VALUE LINE
17.72	19.7	1.30	4.3%	

	2003	2004	2005	2006	2007	2008	2009	2010	2011	
High	19.83	20.04	22.62	22.33	20.67	19.31	18.73	19.59	19.99	High
Low	13.08	15.18	17.20	17.90	18.26	13.00	12.81	16.43	15.16	Low

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%

Fiscal Year	QUARTERLY SALES ($mill.) 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					

Fiscal Year	EARNINGS PER SHARE 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					

Cal-endar	QUARTERLY DIVIDENDS PAID 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)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
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

2014-16 PROJECTIONS

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

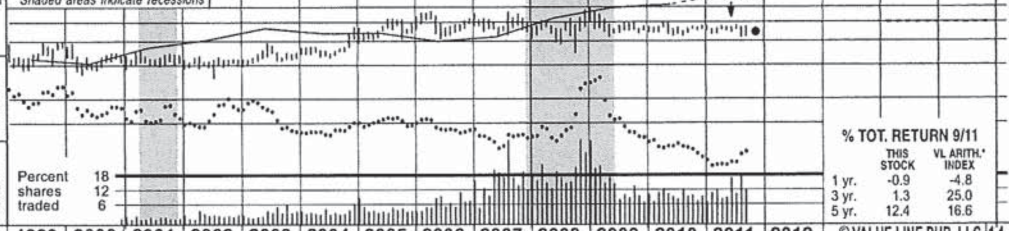
Insider Decisions

	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

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



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.	-0.9	-4.8
3 yr.	1.3	25.0
5 yr.	12.4	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
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*	Revenues per sh	*14.00*
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*	"Cash Flow" per sh	*2.60*
.58	.75	.92	.73	.77	.66	.47	.63	.61	.73	.74	.67	.75	.95	.98	.91	*1.10*	*1.20*	Earnings per sh A	*1.35*
.51	.52	.53	.54	.54	.55	.56	.56	.56	.57	.57	.58	.58	.59	.59	.60	*.62*	*.64*	Div'd Decl'd per sh B ■	*.70*
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*	Cap'l Spending per sh	*3.15*
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*	Book Value per sh C	*11.95*
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*	Common Shs Outst'g D	*46.50*
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	*Bold figures are*		Avg Ann'l P/E Ratio	*20.5*
.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	*Value Line*		Relative P/E Ratio	*1.35*
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%	*estimates*		Avg Ann'l Div'd Yield	*2.8%*

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)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		14-16
246.8	263.2	277.1	315.6	320.7	334.7	367.1	410.3	449.4	460.4	*505*	*530*	Revenues ($mill) E	*650*
14.4	19.1	19.4	26.0	27.2	25.6	31.2	39.8	40.6	37.7	*47.0*	*52.0*	Net Profit ($mill)	*63.0*
39.4%	39.7%	39.9%	39.6%	42.4%	37.4%	39.9%	37.7%	40.3%	39.5%	*35.0%*	*36.5%*	Income Tax Rate	*39.0%*
--	--	10.3%	3.2%	3.3%	10.6%	8.3%	8.6%	7.6%	4.2%	*10.0%*	*10.0%*	AFUDC % to Net Profit	*10.0%*
50.3%	55.3%	50.2%	48.6%	48.3%	43.5%	42.9%	41.6%	47.1%	52.4%	*51.5%*	*51.0%*	Long-Term Debt Ratio	*51.0%*
48.8%	44.0%	49.1%	50.8%	51.1%	55.9%	56.6%	58.4%	52.9%	47.6%	*48.5%*	*49.0%*	Common Equity Ratio	*49.0%*
402.7	453.1	498.4	565.9	568.1	670.1	674.9	690.4	794.9	914.7	*945*	*980*	Total Capital ($mill)	*1125*
624.3	697.0	759.5	800.3	862.7	941.5	1010.2	1112.4	1198.1	1294.3	*1350*	*1410*	Net Plant ($mill)	*1625*
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 Total Cap'l	*7.5%*
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 Shr. Equity	*11.0%*
7.2%	9.5%	7.9%	9.0%	9.3%	6.8%	8.1%	9.9%	9.6%	8.6%	*10.0%*	*10.5%*	Return on Com Equity	*11.0%*
NMF	1.0%	.7%	2.1%	2.1%	1.0%	1.8%	3.8%	3.8%	3.0%	*4.5%*	*5.0%*	Retained to Com Eq	*5.5%*
119%	90%	91%	77%	78%	86%	77%	61%	60%	66%	*55%*	*54%*	All Div'ds to Net Prof	*52%*

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%*

Cal-endar	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*

Cal-endar	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*

Cal-endar	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		

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*

(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.

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

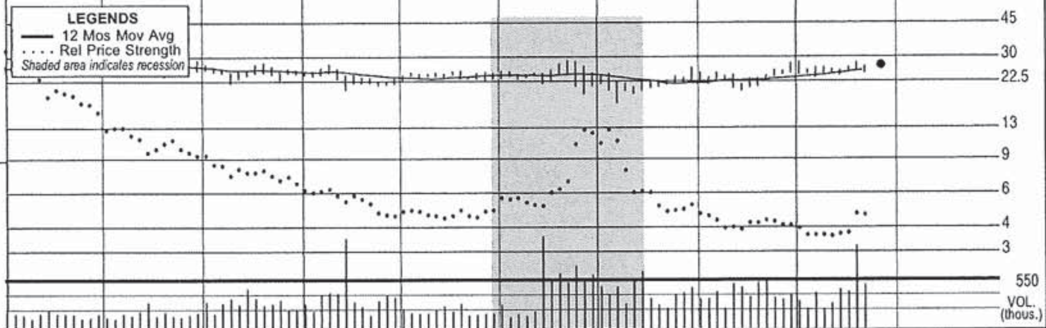
CONN. WATER SERVICES NDQ--CTWS

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

RANKS	2003	2004	2005	2006	2007	2008	2009	2010	2011	
	30.41	29.76	28.17	27.71	25.61	28.95	26.44	27.90	28.27	High
	24.00	23.83	21.91	20.29	22.40	19.26	17.31	20.00	23.27	Low

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 ($MILL)	47.1	48.5	47.5	46.9	59.0	61.3	59.4	66.4	--	*Bold figures*
OPERATING MARGIN	52.1%	51.0%	48.3%	43.7%	40.8%	49.0%	35.8%	40.7%	--	*are consensus*
DEPRECIATION ($MILL)	5.9	6.0	6.1	5.9	7.2	7.1	6.4	7.9	--	*earnings*
NET PROFIT ($MILL)	9.2	9.4	7.2	6.7	8.8	9.4	10.2	9.8	--	*estimates*
INCOME TAX RATE	17.9%	22.9%	--	23.5%	32.4%	27.2%	19.5%	35.2%	--	*and, using the*
NET PROFIT MARGIN	19.5%	19.4%	15.1%	14.3%	14.9%	15.4%	17.2%	14.8%	--	*recent prices,*
WORKING CAP'L ($MILL)	d3.9	d.7	13.0	1.2	8.1	d3.3	d13.1	d14.7	--	*P/E ratios.*
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%

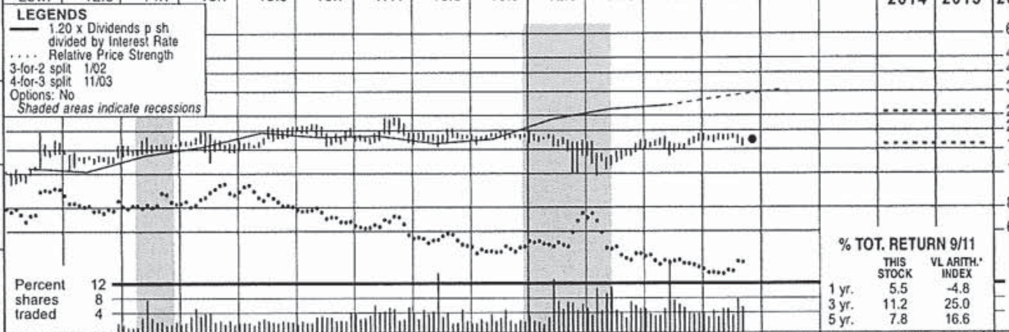
MIDDLESEX WATER NDQ-MSEX

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)

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
High:	17.0	18.7	20.0	21.2	21.8	23.5	20.5	20.2	19.8	17.9	19.3	19.3
Low:	12.5	14.7	13.7	15.8	16.7	17.1	16.5	16.9	12.0	11.6	14.7	16.5

Target Price Range
2014 | 2015 | 2016



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*		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	*Value Line*		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%	*estimates*		Avg Ann'l Div'd Yield	*3.6%*

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)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		14-16
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%*

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%*

Cal-endar	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***

Cal-endar	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***

Cal-endar	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

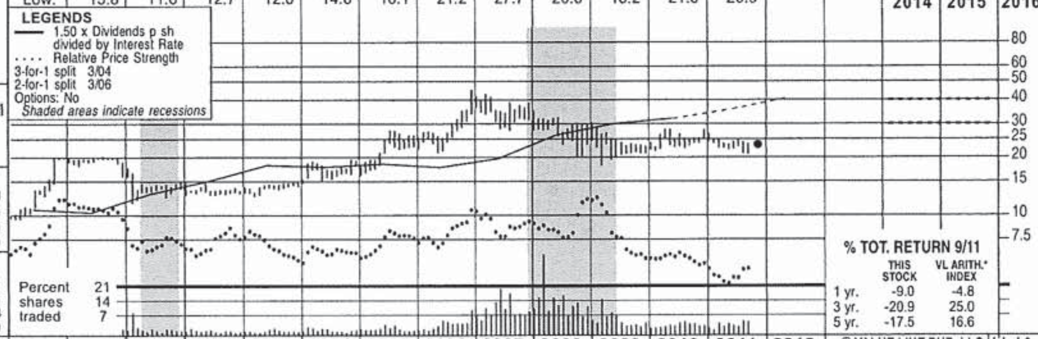
RECENT PRICE 23.38 | P/E RATIO 22.9 (Trailing: 26.9, Median: 22.0) | RELATIVE P/E RATIO 1.67 | DIV'D YLD 3.0% | VALUE LINE

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

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
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

Target Price Range 2014 | 2015 | 2016

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



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

Percent shares traded 21 / 14 / 7

% 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		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	Value Line		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%	estimates		Avg Ann'l Div'd Yield	2.5%

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012		14-16
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%

Cal-endar	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

Cal-endar	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

Cal-endar	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

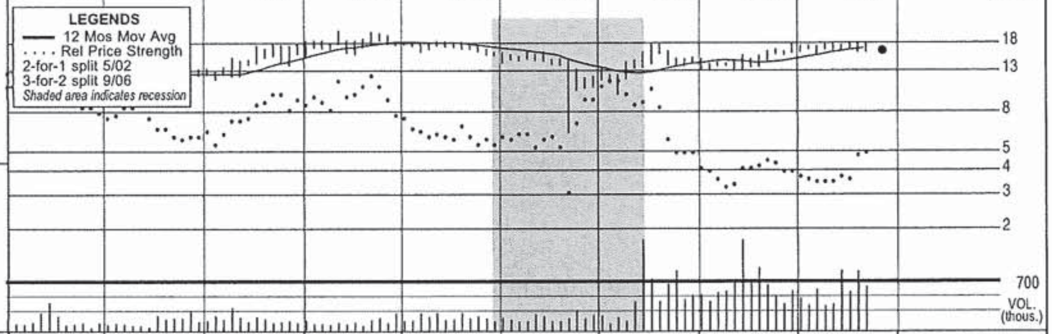
RECENT PRICE 16.40 | TRAILING P/E RATIO 22.2 | RELATIVE P/E RATIO 1.46 | DIV'D YLD 3.2% | VALUE LINE

RANKS	13.49 9.33	14.03 11.00	17.87 11.67	20.99 15.33	18.55 15.45	16.50 6.23	17.95 9.74	18.00 12.83	18.14 15.81	High Low

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

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



© VALUE LINE PUBLISHING 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 ($MILL)	20.9	22.5	26.8	28.7	31.4	32.8	37.0	39.0	--	*Bold figures*
NET PROFIT ($MILL)	4.4	4.8	5.8	6.1	6.4	6.4	7.5	8.9	--	*are consensus*
INCOME TAX RATE	34.8%	36.7%	36.7%	34.4%	36.5%	36.1%	37.9%	38.5%	--	*earnings*
AFUDC % TO NET PROFIT	--	--	--	7.2%	3.6%	10.1%	--	1.2%	--	*estimates*
LONG-TERM DEBT RATIO	43.4%	42.5%	44.1%	48.3%	46.5%	54.5%	45.7%	48.3%	--	*and, using the*
COMMON EQUITY RATIO	56.6%	57.5%	55.9%	51.7%	53.5%	45.5%	54.3%	51.7%	--	*recent prices,*
TOTAL CAPITAL ($MILL)	69.0	83.6	90.3	126.5	125.7	153.4	160.1	176.4	--	*P/E ratios.*
NET PLANT ($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%

Fiscal Year	QUARTERLY SALES ($mill.) 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					

Fiscal Year	EARNINGS PER SHARE 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*				

Cal-endar	QUARTERLY DIVIDENDS PAID 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%

Missouri-American Water Company
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)	4.23 %
2.	Adjustment to Reflect Yield Spread Between Aaa Rated Corporate Bonds and A Rated Public Utility Bonds	0.44 (2)
3.	Adjusted Prospective Yield on A Rated Public Utility Bonds	4.67 %
4.	Adjustment to Reflect Bond Rating Difference of Proxy Group	0.22 (3)
5.	Adjusted Prospective Bond Yield	4.89
6.	Equity Risk Premium (4)	5.45
7.	Risk Premium Derived Common Equity Cost Rate	10.34 %

Notes:
(1) Derived in Note (4) on page 19 of this Schedule.
(2) The average yield spread of A rated public utility bonds over Aaa rated corporate bonds of 0.44% from page 18 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 16 of this Schedule. The 22 basis point adjustment is derived by taking 1/3 of the spread between Baa2 and A2 Public Utility Bond yields. (1/3 * 0.67% = 0.22%)
(4) From page 18 of this Schedule.

Missouri-American Water Company
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 January 2012		Bond Rating January 2012							
	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		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	A	6.1	Excellent	1.0	Intermediate	3.3

Notes: (1) From page 3 of Schedule PMA-10.
(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, Inc.
(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 November 2011 (1)

Months	Corporate Bonds	Public Utility Bonds			Spread - Corporate v. Public Utility Bonds			Spread - Public Utility Bonds	
	Aaa Rated	Aa Rated	A Rated	Baa Rated	Aa (Pub. Util.) over Aaa (Corp.)	A (Pub. Util.) over Aaa (Corp.)	Baa (Pub. Util.) over Aaa (Corp.)	A over Aa	Baa over A
November-11	3.87 %	3.92 %	4.25 %	4.93 %					
October-11	3.98	4.21	4.52	5.24					
September-11	4.09	4.24	4.48	5.11					
Average of Last 3 Months	3.98 %	4.12 %	4.42 %	5.09 %	0.14 %	0.44 %	1.11 %	0.30 %	0.67 %

Notes: (1) All yields are distributed yields.

Source of Information: Mergent Bond Record, December 2011, Vol 78, No. 12.

Missouri-American Water Company
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)	6.78
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	5.45 %

Notes: (1) From page 19 of this Schedule.
(2) From page 8 of Schedule PMA-10.

Missouri-American Water Company
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)	17.80 %
5.	Prospective Yield an Aaa Rated Corporate Bonds (4)	(4.23)
6.	Forecasted Equity Risk Premium	13.57 %
7.	Conclusion of Equity Risk Premium (5)	9.69 %
8.	Adjusted Value Line Beta (6)	0.70
9.	Beta Adjusted Equity Risk Premium	6.78 %

Notes:

(1) Stocks, Bonds, Bills, and Inflation - Market Results for 1926-2010 Yearbook Valuation Edition, Morningstar, Inc., 2011 Chicago, IL.

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

(3) From page 22 of this Schedule.

(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 January 1, 2012 (see page 20 of this Schedule). The estimates are detailed below.

First Quarter 2012	4.00 %
Second Quarter 2012	4.00
Third Quarter 2012	4.20
Fourth Quarter 2012	4.30
First Quarter 2013	4.40
Second Quarter 2013	4.50
Average	4.23 %

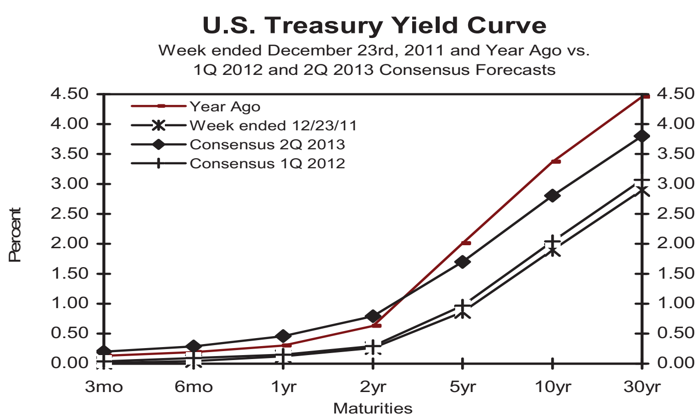
(5) The average of the historical equity risk premium of 5.80% from Line No. 3 and the forecasted equity risk premium of 13.57% from Line No. 6 ((5.80% + 13.57%) / 2 = 9.69%.

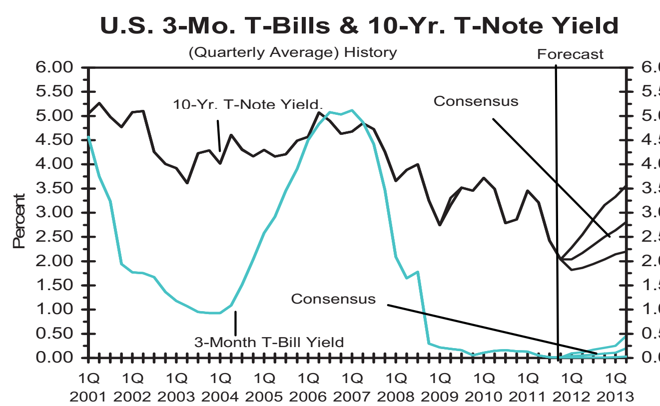
(6) Median beta derived from page 21 of this Schedule.

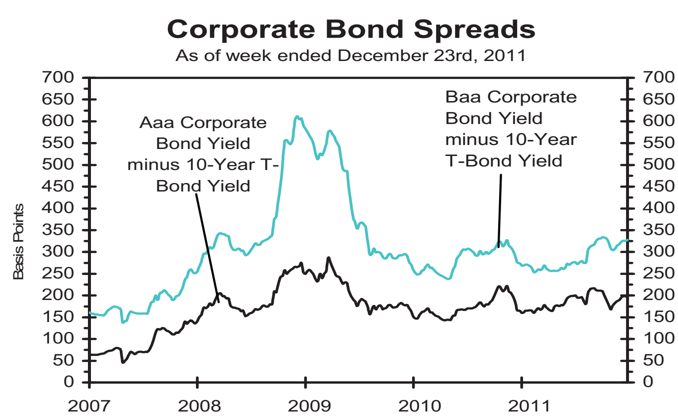
Consensus Forecasts Of U.S. Interest Rates And Key Assumptions[1]

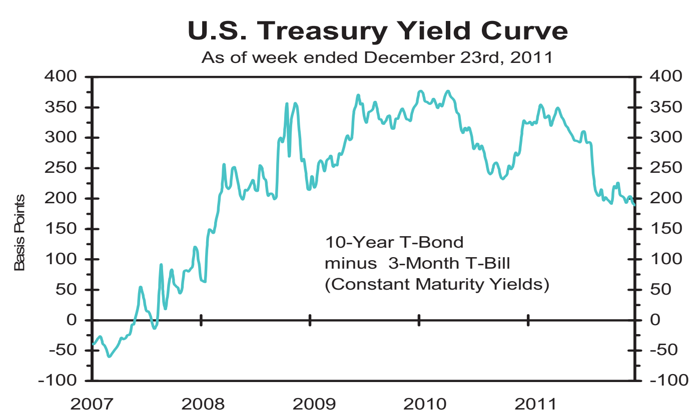
	History								Consensus Forecasts-Quarterly Avg.					
	Average For Week Ending				Average For Month			Latest Q*	1Q	2Q	3Q	4Q	1Q	2Q
Interest Rates	Dec.23	Dec.16	Dec.9	Dec.2	Nov.	Oct.	Sep.	*4Q 2011*	**2012**	**2012**	**2012**	**2012**	**2013**	**2013**
Federal Funds Rate	0.07	0.07	0.08	0.08	0.08	0.07	0.08	*0.07*	**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.	0.57	0.55	0.54	0.52	0.48	0.41	0.35	*0.32*	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
Commercial Paper, 1-mo.	0.10	0.12	0.09	0.11	0.10	0.09	0.08	*0.10*	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**
Treasury bill, 3-mo.	0.01	0.01	0.01	0.02	0.01	0.02	0.01	*0.01*	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**
Treasury bill, 6-mo.	0.04	0.05	0.05	0.06	0.05	0.05	0.04	*0.05*	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.3**
Treasury bill, 1 yr.	0.12	0.11	0.11	0.13	0.11	0.11	0.10	*0.11*	**0.1**	**0.2**	**0.2**	**0.3**	**0.3**	**0.5**
Treasury note, 2 yr.	0.26	0.25	0.24	0.26	0.25	0.28	0.21	*0.26*	**0.3**	**0.3**	**0.4**	**0.5**	**0.6**	**0.8**
Treasury note, 5 yr.	0.86	0.85	0.90	0.94	0.91	1.06	0.90	*0.95*	**1.0**	**1.1**	**1.2**	**1.4**	**1.5**	**1.7**
Treasury note, 10 yr.	1.90	1.94	2.04	2.04	2.01	2.15	1.98	*2.04*	**2.0**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**
Treasury note, 30 yr.	2.90	2.95	3.05	3.02	3.02	3.13	3.18	*3.04*	**3.1**	**3.2**	**3.4**	**3.5**	**3.7**	**3.8**
Corporate Aaa bond	3.85	3.92	4.02	4.00	3.87	3.98	4.09	*3.93*	**4.0**	**4.0**	**4.2**	**4.3**	**4.4**	**4.5**
Corporate Baa bond	5.18	5.20	5.30	5.28	5.14	5.37	5.27	*5.25*	**5.2**	**5.3**	**5.4**	**5.5**	**5.6**	**5.7**
State & Local bonds	3.92	3.92	3.93	4.12	4.05	4.13	4.01	*4.03*	**4.0**	**4.1**	**4.2**	**4.2**	**4.3**	**4.4**
Home mortgage rate	3.91	3.94	3.99	4.00	3.99	4.07	4.11	*4.00*	**4.0**	**4.0**	**4.2**	**4.3**	**4.4**	**4.6**
	History								Consensus Forecasts-Quarterly					
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	*4Q**	**1Q**	**2Q**	**3Q**	**4Q**	**1Q**	**2Q**
Key Assumptions	2010	2010	2010	2010	2011	2011	2011	*2011*	**2012**	**2012**	**2012**	**2012**	**2013**	**2013**
Major Currency Index	74.8	77.6	75.9	73.0	71.9	69.6	69.9	*72.3*	**73.6**	**73.9**	**74.0**	**74.0**	**74.0**	**74.2**
Real GDP	3.9	3.8	2.5	2.3	0.4	1.3	1.8	*3.1*	**2.0**	**2.1**	**2.4**	**2.6**	**2.6**	**2.8**
GDP Price Index	1.5	1.5	1.4	1.9	2.5	2.5	2.6	*1.7*	**1.8**	**1.8**	**1.9**	**1.9**	**2.0**	**2.0**
Consumer Price Index	1.3	-0.5	1.4	2.6	5.2	4.1	3.1	*1.6*	**1.9**	**2.1**	**2.3**	**2.2**	**2.2**	**2.2**

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 4Q 2011 based on historical data through the week ended December 23rd. *Data for 4Q 2011 Major Currency Index also is based on data through week ended December 23rd. Figures for 4Q 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)***.









Missouri-American Water Company
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	10.53 %	3.45 %	11.35 %	12.01 %	
American Water Works Co., Inc.	0.65	10.53	3.45	10.29	11.22	
Aqua America, Inc.	0.65	10.53	3.45	10.29	11.22	
Artesian Resources Corp.	0.60	10.53	3.45	9.77	10.82	
California Water Service Group	0.70	10.53	3.45	10.82	11.61	
Connecticut Water Service, Inc.	0.80	10.53	3.45	11.87	12.40	
Middlesex Water Company	0.75	10.53	3.45	11.35	12.01	
SJW Corporation	0.90	10.53	3.45	12.93	13.19	
York Water Company	0.70	10.53	3.45	10.82	11.61	
Average				11.06 %	11.79 %	11.43 %
Median				10.82 %	11.61	11.22 %

See page 22 for notes.

Missouri-American Water Company
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 accompanying direct testimony, from the thirteen weeks ending January 6, 2012, Value Line Summary & Index, a forecasted 3-5 year total annual market return of 17.80% can be derived by averaging the thirteen weeks ended January 6, 2012 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 78% produces a four-year average annual return of 15.46% (($1.78^{.25}$) - 1). When the average annual forecasted dividend yield of 2.34% is added, a total average market return of 17.80% (2.34% + 15.46%) is derived.

The thirteen week forecasted total market return of 17.80% minus the forecasted risk-free rate of 3.45% (developed in Note 2) is 14.35% (17.80% - 3.45%). 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 14.35% Value Line market premium resulting in an 10.53% market premium. The 10.53% market premium is then multiplied by the beta in column 1 of page 21 of this Schedule.

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(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 January 1, 2012 (see page 20 of this Schedule). The estimates are detailed below:

	30-Year Treasury Note Yield
First Quarter 2012	3.10
Second Quarter 2012	3.20
Third Quarter 2012	3.40
Fourth Quarter 2012	3.50
First Quarter 2013	3.70
Second Quarter 2013	3.80
Average	3.45%

(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
β = 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
β = Value Line Adjusted Beta
R_M = Return on the market as a whole

Source of Information: Value Line Summary & Index
Blue Chip Financial Forecasts, January 1, 2012
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

Missouri-American Water Company
Summary of Cost of Equity Models Applied to the
Proxy Group of Non Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

Principal Methods		Forty-Two Non Price Regulated Companies
Projected Return on Book Common Equity (1)		14.00 %
Average of Market-Based Models (2)		12.41 %
	Average	13.21 %

Notes:
(1) From page 27 of this Schedule.
(2) Average of the results of the DCF (12.84%), RPM (12.72%), and CAPM / ECAPM (11.68%) analyses as shown on pages 28, 29, and 32 of this Schedule, respectively.

Missouri-American Water Company
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.	0.80	0.62	3.6318
American Water Works Co., Inc.	0.65	0.43	3.7667
Aqua America, Inc.	0.65	0.41	2.8589
Artesian Resources Corp.	0.60	0.33	2.5296
California Water Service Group	0.70	0.53	3.5690
Connecticut Water Service, Inc.	0.80	0.64	2.8819
Middlesex Water Company	0.75	0.56	2.7573
SJW Corporation	0.90	0.84	4.3983
York Water Company	0.70	0.48	3.3729
Average	0.73	0.54	3.3074

Beta Range (+/- 2 std. Devs. of Beta)	0.40	0.68
2 std. Devs. of Beta	0.14	
Residual Std. Err. Range (+/- 2 std. Devs. of the Residual Std. Err.)	3.0168	3.5980
Std. dev. of the Res. Std. Err.	0.1453	
2 std. devs. of the Res. Std. Err.	0.2906	

Missouri-American Water Company
Proxy Group of Non-Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

Proxy Group of Forty-Two Non Price Regulated Companies	VL Adjusted Beta	Unadjusted Beta	Residual Standard Error of the Regression
Gallagher (Arthur J.)	0.70	0.54	3.0668
Amgen	0.65	0.43	3.5824
AutoZone Inc.	0.70	0.53	3.3352
Bristol-Myers Squibb	0.75	0.57	3.1171
Brown & Brown	0.70	0.49	3.1582
Capitol Fed. Finl	0.65	0.43	3.2572
CVS Caremark Corp.	0.80	0.66	3.0354
Forest Labs.	0.80	0.63	3.3743
Gen-Probe	0.80	0.68	3.3384
Hasbro, Inc.	0.75	0.60	3.3919
IAC/InterActiveCorp	0.65	0.47	3.2905
Investors Bancorp	0.75	0.55	3.4028
J&J Snack Foods	0.70	0.48	3.3652
Lancaster Colony	0.75	0.56	3.3268
Lincare Holdings	0.65	0.45	3.5487
McKesson Corp.	0.75	0.56	3.3801
Medtronic, Inc.	0.80	0.66	3.5135
Medco Health Solutions	0.70	0.50	3.5446
Marsh & McLennan	0.75	0.58	3.0499
MAXIMUS Inc.	0.75	0.61	3.4659
Microsoft Corp.	0.80	0.68	3.0865
Northwest Bancshares	0.75	0.62	3.3107
Owens & Minor	0.70	0.47	3.3915
OReilly Automotive	0.80	0.63	3.5477
Peoples United Finl	0.65	0.40	3.0978
Rollins, Inc.	0.80	0.66	3.0494
Ross Stores	0.80	0.67	3.5940
Sherwin-Williams	0.70	0.51	3.4289
Smucker (J.M.)	0.70	0.48	3.0447
Sara Lee Corp.	0.80	0.66	3.0463
Stericycle Inc.	0.65	0.46	3.2191
Safeway Inc.	0.70	0.52	3.0677
Stryker Corp.	0.80	0.67	3.2465
Teleflex Inc.	0.80	0.68	3.2493
TJX Companies	0.80	0.67	3.0258
Walgreen Co.	0.75	0.60	3.2564
WD-40 Co.	0.75	0.56	3.4989
Weis Markets	0.65	0.45	3.0549
Watson Pharmac.	0.75	0.56	3.1485
Berkley (W.R.)	0.70	0.51	3.2272
World Wrestling Ent.	0.80	0.65	3.4061
Alleghany Corp.	0.80	0.67	3.2459
Average	0.74	0.57	3.2800
Proxy Group of Nine Water Companies	0.73	0.54	3.3074

Missouri-American Water Company
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 forty-two 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 forty-two non-utility companies was selected based upon the proxy group of nine water companies unadjusted beta range of 0.40 – 0.68 and standard error of the regression range of 3.0168 – 3.5980. These ranges are based upon plus or minus two standard deviations of the unadjusted beta and standard error of the regression as detailed in Ms. Ahern's direct testimony. Plus or minus two standard deviations captures 95.50% 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

$$\text{Thus, } 0.1453 = \frac{3.3074}{\sqrt{518}} = \frac{3.3074}{22.7596}$$

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

Missouri-American Water Company
Comparable Earnings Analysis
for the Proxy Group of Non Price Regulated Companies Comparable to the
Proxy Group of Nine Water Companies(1)

Proxy Group of Forty-Two Non Price Regulated Companies	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	0.54	3.0668	0.0637	14.00 %	(0.3)
Amgen	0.65	0.43	3.5824	0.0744	15.50	(0.2)
AutoZone Inc.	0.70	0.53	3.3352	0.0693	NMF	(1.8)
Bristol-Myers Squibb	0.75	0.57	3.1171	0.0647	23.00	0.6
Brown & Brown	0.70	0.49	3.1582	0.0656	11.50	(0.6)
Capitol Fed. Finl	0.65	0.43	3.2572	0.0676	3.50	(1.5)
CVS Caremark Corp.	0.80	0.66	3.0354	0.0630	11.00	(0.7)
Forest Labs.	0.80	0.63	3.3743	0.0701	9.50	(0.8)
Gen-Probe	0.80	0.68	3.3384	0.0693	12.50	(0.5)
Hasbro, Inc.	0.75	0.60	3.3919	0.0704	30.00	1.4
IAC/InterActiveCorp	0.65	0.47	3.2905	0.0779	7.50	(1.0)
Investors Bancorp	0.75	0.55	3.4028	0.0707	9.50	(0.8)
J&J Snack Foods	0.70	0.48	3.3652	0.0699	13.00	(0.5)
Lancaster Colony	0.75	0.56	3.3268	0.0691	18.00	
Lincare Holdings	0.65	0.45	3.5487	0.0737	25.00	0.8
McKesson Corp.	0.75	0.56	3.3801	0.0702	16.50	(0.1)
Medtronic, Inc.	0.80	0.66	3.5135	0.0730	16.00	(0.1)
Medco Health Solutions	0.70	0.50	3.5446	0.0736	22.50	0.6
Marsh & McLennan	0.75	0.58	3.0499	0.0633	19.00	0.2
MAXIMUS Inc.	0.75	0.61	3.4659	0.0720	28.50	1.2
Microsoft Corp.	0.80	0.68	3.0865	0.0641	36.00 (3)	2.0
Northwest Bancshares	0.75	0.62	3.3107	0.0687	7.50	(1.0)
Owens & Minor	0.70	0.47	3.3915	0.0704	13.00	(0.5)
OReilly Automotive	0.80	0.63	3.5477	0.0737	13.00	(0.5)
Peoples United Finl	0.65	0.40	3.0978	0.0643	6.50	(1.1)
Rollins, Inc.	0.80	0.66	3.0494	0.0633	32.00	1.6
Ross Stores	0.80	0.67	3.5940	0.0746	41.50 (3)	2.6
Sherwin-Williams	0.70	0.51	3.4289	0.0712	26.00	0.9
Smucker (J.M.)	0.70	0.48	3.0447	0.0632	11.00	(0.7)
Sara Lee Corp.	0.80	0.66	3.0463	0.0633	NMF	(1.8)
Stericycle Inc.	0.65	0.46	3.2191	0.0668	15.50	(0.2)
Safeway Inc.	0.70	0.52	3.0677	0.0637	16.50	(0.1)
Stryker Corp.	0.80	0.67	3.2465	0.0674	14.00	(0.3)
Teleflex Inc.	0.80	0.68	3.2493	0.0675	9.50	(0.8)
TJX Companies	0.80	0.67	3.0258	0.0628	44.00 (3)	2.8
Walgreen Co.	0.75	0.60	3.2564	0.0676	20.50	0.3
WD-40 Co.	0.75	0.56	3.4989	0.0727	17.50	0.0
Weis Markets	0.65	0.45	3.0549	0.0634	9.50	(0.8)
Watson Pharmac.	0.75	0.56	3.1485	0.0654	14.00	(0.3)
Berkley (W.R.)	0.70	0.51	3.2272	0.0670	13.50	(0.4)
World Wrestling Ent.	0.80	0.65	3.4061	0.0707	17.00	(0.0)
Alleghany Corp.	0.80	0.67	3.2459	0.0674	5.50	(1.2)
Average	0.74	0.57	3.2807	0.0684		
Average for the Proxy Group of Nine Water Companies	0.73	0.54	3.3074 (1)	0.0697		
Median (4)					14.75%	
Conservative Median (5)					14.00%	

Notes:
(1) From page 26 of this Schedule.
(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 direct
(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.

Missouri-American Water Company
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 Forty-Two Non Price Regulated 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.	4.33 %	9.00 %	9.80 %	9.60 %	9.77 %	9.54 %	4.54 %	14.08 %
Amgen	0.00	7.00	7.00	9.00	7.55	7.64	-	N/A
AutoZone Inc.	0.00	13.50	15.00	15.40	14.07	14.49	-	N/A
Bristol-Myers Squibb	4.05	8.00	0.00	1.50	-0.65	3.17	4.11	7.28
Brown & Brown	1.52	7.00	11.00	13.30	13.00	11.08	1.60	12.68
Capitol Fed. Finl	2.70	8.00	3.00	3.00	3.00	4.25	2.76	7.01
CVS Caremark Corp.	1.34	8.50	11.00	11.80	10.45	10.44	1.40	11.84
Forest Labs.	0.00	NMF	0.00	-2.60	-5.05	0.00	-	N/A
Gen-Probe	0.00	11.00	12.00	14.50	13.14	12.66	-	N/A
Hasbro, Inc.	3.39	10.00	11.00	-	12.70	11.23	3.58	14.81
IAC/InterActiveCorp	0.00	34.00	36.00	35.40	36.03	35.36	-	N/A
Investors Bancorp In	0.00	NMF	15.00	15.00	15.00	15.00	-	N/A
J&J Snack Foods	0.93	10.50	N/A	-	0.00	5.25	0.96	6.21
Lancaster Colony	1.97	6.00	10.00	-	10.00	8.67	2.06	10.73
Lincare Holdings	3.41	12.00	15.00	17.50		14.83	3.66	18.49
McKesson Corp.	1.02	12.00	12.00	12.20	14.02	12.56	1.09	13.65
Medtronic, Inc.	2.79	5.50	7.00	7.50	6.78	6.70	2.88	9.58
Medco Health Solutio	0.00	11.00	14.00	12.80	14.27	13.02	-	N/A
Marsh & McLennan	2.94	28.50	10.00	10.70	11.39	15.15	3.16	18.31
MAXIMUS Inc.	0.90	18.50	7.00	4.00	7.00	9.13	0.94	10.07
Microsoft Corp.	2.46	12.00	10.00	11.10	9.69	10.70	2.59	13.29
Northwest Bancshares	3.60	15.50	5.00	5.00	5.00	7.63	3.74	11.37
Owens & Minor	2.74	10.00	9.50	13.00	9.53	10.51	2.88	13.39
OReilly Automotive	0.00	13.50	16.00	17.20	17.09	15.95	-	N/A
Peoples United Fin	5.13	21.00	21.00	20.00	21.68	20.92	5.66	26.58
Rollins, Inc.	1.32	13.50	N/A	-	10.00	11.75	1.40	13.15
Ross Stores	0.99	18.50	11.00	12.60	10.77	13.22	1.05	14.27
Sherwin-Williams	1.74	11.00	11.00	10.90	11.13	11.01	1.83	12.84
Smucker (J.M.)	2.53	9.50	7.60	8.00	7.63	8.18	2.63	10.81
Sara Lee Corp.	2.54	10.50	8.40	6.00	9.13	8.51	2.65	11.16
Stericycle Inc.	0.00	13.00	17.00	17.50	18.00	16.38	-	N/A
Safeway Inc.	2.98	6.50	8.40	10.40	8.51	8.45	3.11	11.56
Stryker Corp.	1.50	8.00	11.00	10.80	10.65	10.11	1.57	11.68
Teleflex Inc.	2.31	9.00	13.00	10.00	14.90	11.73	2.45	14.18
TJX Companies	1.25	13.50	12.00	14.00	11.45	12.74	1.33	14.07
Walgreen Co.	2.71	13.00	10.00	12.40	9.54	11.24	2.86	14.10
WD-40 Co.	2.58	9.50	12.00	12.00	12.00	11.38	2.73	14.11
Weis Markets	2.99	6.50	N/A	-	0.00	3.25	3.04	6.29
Watson Pharmac.	0.00	11.50	12.00	12.20	12.21	11.98	-	N/A
Berkley (W.R.)	0.97	11.50	11.00	11.30	9.50	10.83	1.02	11.85
World Wrestling Ent.	4.90	5.00	8.50	7.50	10.00	7.75	5.09	12.84
Alleghany Corp.	0.00	10.00	N/A	-	0.00	5.00	-	N/A
Average								12.65
Median								12.84

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 January 2, 2012 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 01/03/2012
www.zacks.com Downloaded on 01/03/2012
www.yahoo.com Downloaded on 01/03/2012

Missouri-American Water Company
Indicated Common Equity Cost Rate
Through Use of a Risk Premium Model
Using an Adjusted Total Market Approach

Line No.		Proxy Group of Forty-Two Non Price Regulated Companies
1.	Prospective Yield on Baa Rated Corporate Bonds (1)	5.45 %
2.	Equity Risk Premium (2)	7.27
3.	Risk Premium Derived Common Equity Cost Rate	12.72 %

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 January 1, 2012 (see page 20 of this Schedule). The estimates are detailed below.

First Quarter 2012	5.20 %
Second Quarter 2012	5.30
Third Quarter 2012	5.40
Fourth Quarter 2012	5.50
First Quarter 2013	5.60
Second Quarter 2013	5.70
Average	5.45 %

(2) From page 31 of this Schedule.

Comparison of Bond Ratings for the
Proxy Group of Non Price Regulated Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

	Moody's Bond Rating December 2011		Standard & Poor's Bond Rating December 2011	
Proxy Group of Forty-Two Non Price Regulated Companies	Bond Rating	Numerical Weighting (1)	Bond Rating	Numerical Weighting (1)
Gallagher (Arthur J.)	NR	- -	NR	- -
Amgen	Baa1	8.0	A+	5.0
AutoZone Inc.	Baa2	9.0	BBB	9.0
Bristol-Myers Squibb	A2	6.0	A+	5.0
Brown & Brown	NR	- -	NR	- -
Capitol Fed. Finl	NR	- -	NR	- -
CVS Caremark Corp.	Baa2	9.0	BBB+	8.0
Forest Labs.	Baa2	9.0	NR	- -
Gen-Probe	NR	- -	NR	- -
Hasbro, Inc.	NR	- -	BBB+	8.0
IAC/InterActiveCorp	Ba2	12.0	NR	- -
Investors Bancorp	NR	- -	NR	- -
J&J Snack Foods	NR	- -	NR	- -
Lancaster Colony	NR	- -	NR	- -
Lincare Holdings	NR	- -	NR	- -
McKesson Corp.	Baa2	9.0	A-	7.0
Medtronic, Inc.	A1	5.0	AA-	4.0
Medco Health Solutions	Baa3	10.0	BBB+	8.0
Marsh & McLennan	Baa2	9.0	BBB-	10.0
MAXIMUS Inc.	NR	- -	NR	- -
Microsoft Corp.	Aaa	1.0	AAA	1.0
Northwest Bancshares	NR	- -	NR	- -
Owens & Minor	Ba2	12.0	BBB-	10.0
OReilly Automotive	Baa3	10.0	NR	- -
Peoples United Finl	A2	6.0	NR	- -
Rollins, Inc.	NR	- -	NR	- -
Ross Stores	NR	- -	NR	- -
Sherwin-Williams	A3	7.0	A	6.0
Smucker (J.M.)	A3	7.0	NR	- -
Sara Lee Corp.	Baa1	8.0	BBB	9.0
Stericycle Inc.	NR	- -	NR	- -
Safeway Inc.	Baa2	9.0	BBB	9.0
Stryker Corp.	A3	7.0	A+	5.0
Teleflex Inc.	Ba3	13.0	NR	- -
TJX Companies	A3	7.0	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
World Wrestling Ent.	NR	- -	NR	- -
Alleghany Corp.	Baa2	9.0	NR	- -
Average	Baa1	8.3	A-	6.9

Notes:
(1) From page 3 of Schedule PMA-10.

Source of Information:
Standard & Poor's Bond Guide December 2011
www.moodys.com; downloaded 1/3/2012

Missouri-American Water Company
Derivation of Equity Risk Premium Based on the Total Market Approach
Using the Beta for
the Proxy Group of Non Price Regulated Companies
Comparable in Total Risk to the
Proxy Group of Nine Water Companies

Line No.		Proxy Group of Forty-Two Non Price Regulated 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)	17.80 %
5.	Prospective Yield an Aaa Rated Corporate Bonds (4)	(4.23)
6.	Forecasted Equity Risk Premium	13.57 %
7.	Conclusion of Equity Risk Premium (5)	9.69 %
8.	Adjusted Value Line Beta (6)	0.75
9.	Beta Adjusted Equity Risk Premium	7.27 %

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 22 of this Schedule.
(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 January 1, 2012 (see page 20 of this Schedule). The estimates are detailed below.

First Quarter 2012	4.00 %
Second Quarter 2012	4.00
Third Quarter 2012	4.20
Fourth Quarter 2012	4.30
First Quarter 2013	4.40
Second Quarter 2013	4.50
Average	4.23 %

(5) The average of the historical equity risk premium of 5.80% from Line No. 3 and the forecasted equity risk premium of 13.57% from Line No. 6 ((5.80% + 13.57%) / 2 = 9.69%.
(6) Median beta derived from page 21 of this Schedule.

Missouri-American Water Company
Traditional CAPM and ECAPM Results for the Proxy Group of Non Price Regulated Companies Comparable in Total Risk to the
Proxy Group of Nine Water Companies

Proxy Group of Forty-Two Non Price Regulated 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	10.53	3.45	10.82	11.61	
Amgen	0.65	10.53	3.45	10.29	11.22	
AutoZone Inc.	0.70	10.53	3.45	10.82	11.61	
Bristol-Myers Squibb	0.75	10.53	3.45	11.35	12.01	
Brown & Brown	0.70	10.53	3.45	10.82	11.61	
Capitol Fed. Finl	0.65	10.53	3.45	10.29	11.22	
CVS Caremark Corp.	0.80	10.53	3.45	11.87	12.40	
Forest Labs.	0.80	10.53	3.45	11.87	12.40	
Gen-Probe	0.80	10.53	3.45	11.87	12.40	
Hasbro, Inc.	0.75	10.53	3.45	11.35	12.01	
IAC/InterActiveCorp	0.65	10.53	3.45	10.29	11.22	
Investors Bancorp	0.75	10.53	3.45	11.35	12.01	
J&J Snack Foods	0.70	10.53	3.45	10.82	11.61	
Lancaster Colony	0.75	10.53	3.45	11.35	12.01	
Lincare Holdings	0.65	10.53	3.45	10.29	11.22	
McKesson Corp.	0.75	10.53	3.45	11.35	12.01	
Medtronic, Inc.	0.80	10.53	3.45	11.87	12.40	
Medco Health Solutions	0.70	10.53	3.45	10.82	11.61	
Marsh & McLennan	0.75	10.53	3.45	11.35	12.01	
MAXIMUS Inc.	0.75	10.53	3.45	11.35	12.01	
Microsoft Corp.	0.80	10.53	3.45	11.87	12.40	
Northwest Bancshares	0.75	10.53	3.45	11.35	12.01	
Owens & Minor	0.70	10.53	3.45	10.82	11.61	
OReilly Automotive	0.80	10.53	3.45	11.87	12.40	
Peoples United Finl	0.65	10.53	3.45	10.29	11.22	
Rollins, Inc.	0.80	10.53	3.45	11.87	12.40	
Ross Stores	0.80	10.53	3.45	11.87	12.40	
Sherwin-Williams	0.70	10.53	3.45	10.82	11.61	
Smucker (J.M.)	0.70	10.53	3.45	10.82	11.61	
Sara Lee Corp.	0.80	10.53	3.45	11.87	12.40	
Stericycle Inc.	0.65	10.53	3.45	10.29	11.22	
Safeway Inc.	0.70	10.53	3.45	10.82	11.61	
Stryker Corp.	0.80	10.53	3.45	11.87	12.40	
Teleflex Inc.	0.80	10.53	3.45	11.87	12.40	
TJX Companies	0.80	10.53	3.45	11.87	12.40	
Walgreen Co.	0.75	10.53	3.45	11.35	12.01	
WD-40 Co.	0.75	10.53	3.45	11.35	12.01	
Weis Markets	0.65	10.53	3.45	10.29	11.22	
Watson Pharmac.	0.75	10.53	3.45	11.35	12.01	
Berkley (W.R.)	0.70	10.53	3.45	10.82	11.61	
World Wrestling Ent.	0.80	10.53	3.45	11.87	12.40	
Alleghany Corp.	0.80	10.53	3.45	11.87	12.40	
Average				11.22	11.91	11.57
Median				11.35	12.01	11.68

Notes:
(1) From note 1 on page 22 of this Schedule.
(2) From note 2 on page 22 of this Schedule.
(3) Derived from the model shown on page 22 of this Schedule, note 3.
(4) Derived from the model shown on page 22 of this Schedule, note 4.
(5) Average of CAPM and ECAPM cost rates.

Missouri-American Water Company
Derivation of the Floatation Cost Adjustment to the Cost of Common Equity

Equity Issuances and Floatation Costs of the Parent Since 2009

		[Column 1]	[Column 2]	[Column 3]	[Column 4]	[Column 5]	[Column 6]	[Column 7]	[Column 8]	[Column 9]	[Column 10]
Date	Transaction (1)	Shares Issued	Market Price per Share	Offering Price per Share	Market Pressure (2)	Underwriting Discount	Net Proceeds per Share (3)	Gross Equity Issue before Costs (4)	Total Net Proceeds (5)	Total Floatation Costs (6)	Flotation Cost Perecentage (7)
06/10/09	Primary Equity Offering	11,500,000	$ 17.4900	$ 17.2500	$ 0.2400	$ 0.5180	$ 16.7320	$ 201,135,000	$ 192,418,000	$ 8,717,000	4.33%
								$ 201,135,000	$ 192,418,000	$ 8,717,000	4.33%

Flotation Cost Adjustment

	Average Dividend Yield	Average Projected EPS Growth Rate	Adjusted Dividend Yield	Average DCF Cost Rate Unadjusted for Flotation (8)	DCF Cost Rate Adjusted for Flotation (9)	Flotation Cost Adjustment (10)
Proxy Group of Nine Water Companies	3.35 %	7.08 %	3.47 %	10.55 %	10.71 %	0.16 %

See page 34 of this Schedule for notes.

Missouri-American Water Company
Notes to Accompany the
Derivation of the Flotation Cost Adjustment to the Cost of Common Equity

(1) Company-provided.

(2) Column 2 – Column 3.

(3) Column 2 – the sum of columns 4 and 5.

(4) Column 1 * Column 2.

(5) Column1 * Column 6.

(6) Column1 * (the sum of columns 4 and 5).

(7) (Column 7 – Column 8) divided by Column 7.

(8) Using the average growth rate from Schedule 7.

(9) Adjustment for flotation costs based on adjusting the average DCF constant growth cost rate in accordance with the following:

$$K = \frac{D(1+0.5g)}{P(1-F)} + g \, ,$$

where g is the growth factor and F is the percentage of flotation costs.

(10) Flotation cost adjustment of 0.16% equals the difference between the flotation adjusted average DCF cost rate of 10.71% and the unadjusted average DCF cost rate of 10.55% of the proxy group of nine water companies.

Source of Information:

Company provided information

Missouri-American Water Company
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 January 2, 2012 (1) (millions)	1 (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.	Missouri-American Water Company					
a.	Based Upon the Proxy Group of Nine Water Companies	$ 776.975		7-8	2.27%	
2.	Proxy Group of Nine Water Companies	$ 1,039.534	1.3	6-7	1.85%	0.42%

	(A) Decile	(B) Number of Companies (millions)	(C) Recent Total Market Capitalization (millions)	(D) Recent Average Market Capitalization (millions)	(E)
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 36 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 0.42% in Column 4, Line No. 2 is derived as follows 0.42% = 2.27% - 1.85%.

Missouri-American Water Company
Market Capitalization of Missouri-American Water Company and
the Proxy Group of Nine Water Companies

Company	Exchange	1 Common Stock Shares Outstanding at Fiscal Year End 2010 (millions)	2 Book Value per Share at Fiscal Year End 2010 (1)	3 Total Common Equity at Fiscal Year End 2010 (millions)	4 Closing Stock Market Price on January 02, 2012	5 Market-to-Book Ratio on January 02, 2012 (2)	6 Market Capitalization on January 02, 2012 (3) (millions)
Missouri-American Water Company		NA	NA	$ 415.717 (4)	NA		
Based Upon the Proxy Group of Nine Water Companies						186.9 % (5)	$ 776.975 (6)
Proxy Group of Nine Water Companies							
American States Water Co.		18.631	$ 20.264	$ 377.541	$ 34.900	172.2 %	$ 650.217
American Water Works Co., Inc.		174.996	$ 23.614	$ 4,132.272	$ 31.860	134.9	$ 5,575.373
Aqua America, Inc.		138.449	$ 8.481	$ 1,174.254	$ 22.050	260.0	
Artesian Resources Corp.		7.517	$ 12.657	$ 95.146	$ 18.830	148.8	$ 141.547
California Water Service Group		41.666	$ 10.453	$ 435.526	$ 18.260	174.7	$ 760.821
Connecticut Water Service, Inc.		8.677	$ 13.134	$ 113.963	$ 27.130	206.6	$ 235.403
Middlesex Water Company		15.566	$ 11.132	$ 173.279	$ 18.660	167.6	$ 290.462
SJW Corporation		18.552	$ 13.747	$ 255.032	$ 23.640	172.0	$ 438.558
York Water Company		12.692	$ 7.190	$ 91.257	$ 17.640	245.3	$ 223.888
Average		48.527	$ 13.408	$ 760.919	$ 23.663	186.9 %	$ 1,039.534

NA= Not Available

Notes:
(1) Column 3 / Column 1.
(2) Column 4 / Column 2.
(3) Column 5 * Column 3.
(4) From Financial Statements of Missouri-American Water Company for Fiscal Year End 2010.
(5) The market-to-book ratio of Missouri-American Water Company on January 02, 2012 is assumed to be equal to the market-to-book ratio of the Proxy Group of Nine Water Companies at January 02, 2012.
(6) Missouri-American Water Company's common stock, if traded, would trade at a market-to-book ratio equal to the average market-to-book ratio at January 02, 2012 of the Proxy Group of Nine Water Companies, 186.9%, and Missouri-American Water Company's market capitalization on January 02, 2012 would therefore have been $776.975 million.

Source of Information: 2010 Annual Forms 10K
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