BEFORE THE

TENNESSEE REGULATORY AUTHORITY

PREPARED DIRECT TESTIMONY

OF

DR. ROGER A. MORIN

IN RE:

CHATTANOOGA GAS COMPANY

DOCKET NO. 06-00175

TABLE OF CONTENTS

BEFORE THE

TENNESSEE REGULATORY AUTHORITY

PREPARED DIRECT TESTIMONY
OF
DR. ROGER A. MORIN

IN RE:

CHATTANOOGA GAS COMPANY

DOCKET NO. ________

INTRODUCTION AND SUMMARY

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

A. My name is Dr. Roger A. Morin. My business address is Georgia State University, Robinson College of Business, University Plaza, Atlanta, Georgia 30303. I am Professor of Finance at the College of Business, Georgia State University, and Professor of Finance for Regulated Industry at the Center for the Study of Regulated Industry at Georgia State University. I am also a principal in Utility Research International, an enterprise engaged in regulatory finance and economics consulting to business and government.

Q. Please describe your educational background.

A. I hold a Bachelor of Engineering degree and an M.B.A. in Finance from McGill University, Montreal, Canada. I received my Ph.D. in Finance and Econometrics at the Wharton School of Finance, University of Pennsylvania.

Q. Please summarize your academic and business career.

A. I have taught at the Wharton School of Finance, University of Pennsylvania, Amos Tuck School of Business at Dartmouth College, Drexel University, University of Montreal, McGill University, and Georgia State University. I was a faculty member of Advanced

Management Research International, and I am currently a faculty member of The Management Exchange Inc. and Exnet, where I continue to conduct frequent national executive-level education seminars throughout the United States and Canada. In the last twenty five years, I have conducted numerous national seminars on "Utility Finance," "Utility Cost of Capital," "Alternative Regulatory Frameworks," and on "Utility Capital Allocation," which I have developed on behalf of The Management Exchange Inc. in conjunction with Public Utilities Reports, Inc.

I have authored or co-authored several books, monographs, and articles in academic scientific journals on the subject of finance. They have appeared in a variety of journals, including The Journal of Finance, The Journal of Business Administration, International Management Review, and Public Utility Fortnightly. I published a widely-used treatise on regulatory finance, Utilities' Cost of Capital, Public Utilities Reports, Inc., Arlington, Virginia, 1984. My second book on regulatory matters, Regulatory Finance, is a voluminous treatise on the application of finance to regulated utilities and was released by the same publisher in late 1994. A revised and expanded edition, entitled The New Regulatory Finance, is scheduled for publication at the time of this writing. I have engaged in extensive consulting activities on behalf of numerous corporations, legal firms, and regulatory bodies in matters of financial management and corporate litigation. Exhibit RAM-1 describes my professional credentials in more detail.

Q. **Have you previously testified on cost of capital before utility regulatory commissions?**

A. Yes, I have been a cost of capital witness before nearly fifty (50) regulatory bodies in North America, including the Tennessee Regulatory Authority ("TRA" or

"Commission"), the Federal Energy Regulatory Commission, and the Federal Communications Commission. I have also testified before the following state, provincial, and other local regulatory commissions:

Alabama	Hawaii	Nevada	Oregon
Alaska	Illinois	New Brunswick	Pennsylvania
Alberta	Indiana	New Hampshire	Quebec
Arizona	Iowa	New Jersey	South Carolina
Arkansas	Kentucky	New York	South Dakota
British Columbia	Louisiana	Newfoundland	Tennessee
California	Manitoba	North Carolina	Texas
Colorado	Michigan	North Dakota	Utah
Delaware	Minnesota	Nova Scotia	Vermont
District of Columbia	Mississippi	Ohio	Virginia
Florida	Missouri	Oklahoma	Washington
Georgia	Montana	Ontario	West Virginia

The details of my participation in regulatory proceedings are provided in Exhibit RAM-1.

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony in this proceeding is to present an independent appraisal of the fair and reasonable rate of return on the common equity capital invested in the natural gas distribution business of the Chattanooga Gas Company ("CGC" or the "Company"), which is a wholly-owned subsidiary of AGLR Resources ("AGLR"). Based upon this appraisal, I have formed my professional judgment as to a return on such capital that would: (1) be fair to the ratepayer, (2) allow the Company to attract capital on reasonable terms, (3) maintain the Company's financial integrity, and (4) be comparable to returns offered on comparable risk investments. I will testify in this proceeding as to that opinion. I have also been asked to recommend a cost efficient capital structure for the Company and to comment on the Company's proposed rate design and tracker mechanism on the cost of common equity capital.

Q. Please briefly identify the exhibits and appendices accompanying your testimony.

A. I have attached to my testimony exhibits Exhibit RAM-1 through Exhibit RAM-8 and Appendices A and B. These exhibits and appendices relate directly to points in my testimony and are described in further detail in connection with the discussion of those points in my testimony.

Q. Please summarize your findings concerning CGC's cost of common equity.

A. I have examined CGC's risks and concluded that CGC's risk environment slightly exceeds the industry average on account of its very small size and declining demand. It is my opinion that a just and reasonable return on common equity ("ROE") for CGC at this time is 11.5%. If the Company's proposed Conservation and Usage Adjustment rider (CUA) and Pipeline Replacement Program (PRP) mechanism are approved, it is my opinion that a just and reasonable ROE for CGC is 11.0%. My recommendation is derived from studies I performed using the Capital Asset Pricing Model ("CAPM"), Risk Premium, and Discounted Cash Flow ("DCF") methodologies. I performed two risk premium analyses: (1) a historical risk premium analysis on the natural gas distribution industry, and (2) a study of the risk premiums allowed in the natural gas distribution industry. I also performed DCF analyses on two surrogates for the Company's natural gas distribution business. They are: a group of natural gas distribution utilities and a group of investment-grade combination gas and electric utilities. The results were adjusted to account for the above average risks faced by CGC relative to the industry on account of its very small size and declining demand.

My recommended rate of return reflects the application of my professional judgment to the results in light of the indicated returns from my Risk Premium, CAPM, and DCF analyses. Moreover, my recommended return is predicated on the long-term components of a capital structure (long-term debt and common equity) having a 50/50 split.

Q. **Please explain how low authorized returns on equity can increase both the future cost of equity and debt financing.**

A. If a utility is authorized a return on equity below the level required by equity investors, the utility will find it difficult to access the equity market through common stock issuance at its current market price. Investors will not provide equity capital at the current market price if the earnable return on equity is below the level they require given the risks of an equity investment in the utility. The equity market corrects this by generating a stock price in equilibrium that reflects the valuation of the potential earnings stream from an equity investment at the risk-adjusted return equity investors require. In the case of a utility that has been authorized a return below the level investors believe is appropriate for the risk they bear, the result is a decrease in the utility's market price per share of common stock. This reduces the financial viability of equity financing in two ways. First, because the utility's share price per common stock decreases, the net proceeds from issuing common stock are reduced. Second, since the utility's market to book ratio decreases with the decrease in the share price of common stock, the potential risks from dilution of equity investments reduces investors' inclination to purchase new issues of common stock. The ultimate effect is the utility will have to rely more on debt financing to meet its capital needs.

As the company relies more on debt financing, its capital structure becomes more leveraged. Because debt payments are a fixed financial obligation to the utility, and income available to common equity is subordinate to fixed charges, this decreases the operating income available for dividend and earnings growth. Consequently, equity investors face greater uncertainty about future dividends and earnings from the firm. As a result, the firm's equity becomes a riskier investment. The risk of default on the company's bonds also increases, making the utility's debt a riskier investment. This increases the cost to the utility from both debt and equity financing and increases the possibility the company will not have access to the capital markets for its outside financing needs. Ultimately, to ensure that CGC has access to capital markets for its capital needs, a fair and reasonable authorized rate of return on common equity capital of 11.5% is required.

Q. Please describe how your testimony is organized.

A. The remainder of my testimony is divided into three (3) sections:

(i) Regulatory Framework and Rate of Return;

(ii) Cost of Equity Estimates; and

(iii) Summary and Recommendation.

The first section discusses the rudiments of rate of return regulation and the basic notions underlying rate of return. The second section contains the application of CAPM, Risk Premium, and DCF tests. In the third section, the results from the various approaches used in determining a fair return are summarized.

I.
REGULATORY FRAMEWORK AND RATE OF RETURN

Q. What economic and financial concepts have guided your assessment of the Company's cost of common equity?

A. Two fundamental economic principles underlie the appraisal of the Company's cost of equity, one relating to the supply side of capital markets, the other to the demand side.

According to the first principle, a rational investor is maximizing the performance of his portfolio only if he expects the returns earned on investments of comparable risk to be the same. If not, the rational investor will switch out of those investments yielding lower returns at a given risk level in favor of those investment activities offering higher returns for the same degree of risk. This principle implies that a company will be unable to attract the capital funds it needs to meet its service demands and to maintain financial integrity unless it can offer returns to capital suppliers that are comparable to those achieved on competing investments of similar risk. On the demand side, the second principle asserts that a company will continue to invest in real physical assets if the return on these investments exceeds or equals the company's cost of capital. This concept suggests that a regulatory commission should set rates at a level sufficient to create equality between the return on physical asset investments and the company's cost of capital.

Q. How does the Company's cost of capital relate to that of its parent company, AGLR?

A. I am treating CGC as a separate stand-alone entity, distinct from its parent company AGLR, because it is the cost of capital for CGC that we are attempting to measure and not the cost of capital for AGLR's consolidated overall activities. Financial theory clearly establishes that the true cost of capital depends on the use to which the capital is put, in this case CGC's natural gas distribution operations in the State of Tennessee. The specific source of funding an investment and the cost of funds to the investor are irrelevant considerations.

For example, if an individual investor borrows money at the bank at an after-tax cost of 8% and invests the funds in a speculative oil extraction venture, the required return on the investment is not the 8% cost but rather the return foregone in speculative projects of similar risk, say 20%. Similarly, the required return on CGC is the return foregone in comparable risk natural gas distribution operations, and is unrelated to the parent's cost of capital. The cost of capital is governed by the risk to which the capital is exposed and not by the source of funds. The identity of the shareholders has no bearing on the cost of equity.

Just as individual investors require different returns from different assets in managing their personal affairs, corporations should behave in the same manner. A parent company normally invests money in many operating companies of varying sizes and varying risks. These operating subsidiaries pay different rates for the use of investor capital, such as long-term debt capital, because investors recognize the differences in capital structure, risk, and prospects between subsidiaries. Therefore, the cost of investing funds in an operating utility division such as CGC is the return foregone on investments of similar risk and is unrelated to the identity of the investor.

Q. Under traditional cost of service regulation, please explain how a regulated company's rates should be set.

A. Under the traditional regulatory process, a regulated company's rates should be set so that the company recovers its costs, including taxes and depreciation, plus a fair and reasonable return on its invested capital. The allowed rate of return must necessarily reflect the cost of the funds obtained, that is, investors' return requirements. In determining a company's rate of return, the starting point is investors' return requirements in financial markets. A rate of return can then be set at a level sufficient to enable the company to earn a return commensurate with the cost of those funds.

Funds can be obtained in two general forms, debt capital and equity capital. The cost of debt funds can be easily ascertained from an examination of the contractual interest payments. The cost of common equity funds, that is, investors' required rate of return, is more difficult to estimate. It is the purpose of the next section of my testimony to estimate CGC's cost of common equity capital.

Q. What must be considered in estimating a fair return on common equity?

A. The basic premise is that the allowable return on equity should be commensurate with returns on investments in other firms having corresponding risks. The allowed return should be sufficient to assure confidence in the financial integrity of the firm, in order to maintain creditworthiness and ability to attract capital on reasonable terms. The attraction of capital standard focuses on investors' return requirements that are generally determined using market value methods, such as the Risk Premium, CAPM, or DCF methods. These market value tests define fair return as the return investors anticipate when they purchase equity shares of comparable risk in the financial marketplace. This is a market rate of return, defined in terms of anticipated dividends and capital gains as determined by expected changes in stock prices, and reflects the opportunity cost of capital. The economic basis for market value tests is that new capital will be attracted to a firm only if the return expected by the suppliers of funds is commensurate with that available from alternative investments of comparable risk.

Q. How is a utility's fair return derived?

A. The fair return in dollars is obtained by multiplying the rate of return set by the regulator by the utility's "rate base." The rate base is essentially the net book value of the utility's plant and other assets used to provide utility service.

Q. What fundamental principles underlie the determination of a fair and reasonable rate of return on common equity?

A. The heart of utility regulation is the setting of just and reasonable rates by way of a fair and reasonable return. There are two landmark United States Supreme Court cases that define the legal principles underlying the regulation of a public utility's rate of return and provide the foundations for the notion of a fair return:

1. *Bluefield Water Works and Improvement Co. v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923), and

2. *Federal Power Commission v. Hope Natural Gas Company*, 320 U.S. 391 (1944).

The *Bluefield* case set the standard against which just and reasonable rates of return are measured:

> *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 money necessary for the proper discharge of its public duties.* (Emphasis added).

The *Hope* case expanded on the guidelines to be used to assess the reasonableness of the allowed return. The Court reemphasized its statements in the *Bluefield* case and recognized that revenues must cover "capital costs." The Court stated:

From the investor or company point of view it is important that there be enough revenue not only for operating expenses but also for the capital costs of the business. These include service on the debt and dividends on the stock ... By that standard the <u>return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks</u>. That return, moreover, should be sufficient to <u>assure confidence in the financial integrity</u> of the enterprise, so as to maintain its credit and attract capital. (Emphasis added).

The United States Supreme Court reiterated the criteria set forth in *Hope* in *Federal Power Commission v. Memphis Light, Gas and Water Division*, 411 U.S. 458 (1973), in *Permian Basin Rate Cases*, 390 U.S. 747 (1968), and most recently in *Duquesne Light Co. v. Barasch*, 488 U.S. 299 (1989). In the *Permian* cases, the Supreme Court stressed that a regulatory agency's rate of return order should: "*. . . reasonably be expected to maintain financial integrity, attract necessary capital, and fairly compensate investors for the risks they have assumed . . ..*"

Therefore, the "end result" of this Commission's decision should be to allow CGC the opportunity to earn a return on equity that is: (1) commensurate with returns on investments in other firms having corresponding risks, (2) sufficient to assure confidence in the Company's financial integrity, and (3) sufficient to maintain the Company's creditworthiness and ability to attract capital on reasonable terms.

Q. How is the fair rate of return determined?

A. The aggregate return required by investors is called the "cost of capital." The cost of capital is the opportunity cost, expressed in percentage terms, of the total pool of capital employed by the Company. It is the composite weighted cost of the various classes of capital (e.g., bonds, preferred stock, common stock) used by the utility, with the weights reflecting the proportions of the total capital that each class of capital represents.

While utilities like CGC enjoy varying degrees of monopoly in the sale of public utility services, they must compete with everyone else in the free, open market for the input factors of production, whether labor, materials, or machines. The prices of these inputs are set in the competitive marketplace by supply and demand, and it is these input prices that are incorporated in the cost of service computation. This is just as true for capital as for any other factor of production. Since utilities and other investor-owned businesses must go to the open capital market and sell their securities in competition with every other issuer, there is obviously a market price to pay for the capital they require, for example, the interest on debt capital, or the expected return on equity.

Q. How does the concept of a fair return relate to the concept of opportunity cost?

A. The concept of a fair return is intimately related to the economic concept of "opportunity cost." When investors supply funds to a utility by buying its stocks or bonds, they are not only postponing consumption, giving up the alternative of spending their dollars in some other way, they are also exposing their funds to risk and forgoing returns from investing their money in alternative comparable risk investments. If there are differences in the risk of the investments, competition among firms for a limited supply of capital will bring different prices. These differences in risk are translated by the capital markets into differences in required return, in much the same way that differences in the characteristics of commodities are reflected in different prices.

The important point is that the required return on capital is set by supply and demand, and is influenced by the relationship between the risk and return expected for those securities and the risks expected from the overall menu of available securities.

Q. How does the Company obtain its capital and how is its overall cost of capital determined?

A. The funds employed by the Company are obtained in two general forms, debt capital and equity capital. The latter consists of preferred equity capital and common equity capital. The cost of debt funds and preferred stock funds can be ascertained easily from an examination of the contractual interest payments and preferred dividends. The cost of common equity funds, that is, equity investors' required rate of return, is more difficult to estimate because the dividend payments received from common stock are not contractual or guaranteed in nature. They are uneven and risky, unlike interest payments. Once a cost of common equity estimate has been developed, it can then easily be combined with the embedded costs of debt and preferred stock, based on the utility's capital structure, in order to arrive at the overall cost of capital (overall return).

Q. What is the market required rate of return on equity capital?

A. The market required rate of return on common equity, or cost of equity, is the return demanded by the equity investor. Investors establish the price for equity capital through their buying and selling decisions in capital markets. Investors set return requirements according to their perception of the risks inherent in the investment, recognizing the opportunity cost of forgone investments in other companies, and the returns available from other investments of comparable risk.

II.
COST OF EQUITY CAPITAL ESTIMATES

Q. Dr. Morin, how did you estimate the fair rate of return on common equity for CGC?

A. I employed three methodologies: (1) the CAPM, (2) the Risk Premium, and (3) the DCF methodologies. All three are market-based methodologies and are designed to estimate the return required by investors on the common equity capital committed to CGC.

Q. Why did you use more than one approach for estimating the cost of equity?

A. 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 errors and vagaries in individual companies' market data. Examples of such vagaries include dividend suspension, insufficient or unrepresentative historical data due to a recent merger, impending merger or acquisition, and a new corporate identity due to restructuring activities. The advantage of using several different approaches is that the results of each one can be used to check the others.

As a general proposition, it is extremely dangerous to rely on only one generic methodology to estimate equity costs. The difficulty is compounded when only one variant of that methodology is employed. It is compounded even further when that one methodology is applied to a single company. Hence, several methodologies applied to several comparable risk companies should be employed to estimate the cost of capital.

Q. Dr. Morin, are you aware that some regulatory commissions and some analysts have placed principal reliance on DCF-based analyses to determine the cost of equity for public utilities?

A. Yes, I am.

Q. Do you agree with this approach?

A. While I agree that it is certainly appropriate to consider the results of 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. There are three broad generic methodologies available to measure the cost of equity: DCF, Risk Premium, and CAPM. All of these methodologies are accepted and used by the financial community and supported in the financial literature.

When measuring the cost of common equity, which is essentially the measurement of investor expectations, no one single methodology provides a foolproof panacea. 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 the theory and apply the methodology. The failure of the traditional infinite growth DCF model to account for changes in relative market valuation, and the practical difficulties of specifying the expected growth component are vivid examples of the potential shortcomings of the DCF model. It follows that more than one methodology should be employed in arriving at a judgment on the cost of equity and that these methodologies should be applied to multiple groups of comparable risk companies.

There is no single model that conclusively determines or estimates the expected return for an individual firm. Each methodology has its own way of examining investor behavior, its own premises, and its own set of simplifications of reality. Investors do not necessarily subscribe to any one method, nor does the stock price reflect the application of any one single method by the price-setting investor. Absent any hard evidence, which does not exist as far as I am concerned, as to which method outperforms the other, all relevant evidence should be used, in order to minimize judgmental error, measurement error, and conceptual infirmities. I submit that a regulatory body should rely on the results of a variety of methods applied to a variety of comparable groups. It is unwarranted to conclude that the DCF model standing alone is necessarily the ideal or best predictor of the stock price and of the cost of equity reflected in that price, just as it should not be concluded that the CAPM or Risk Premium models standing alone produce the perfect or best explanation of that stock price or the cost of equity. As a result, all the various methodologies to estimate the cost of equity should be considered.

Q. Does the financial literature support the use of more than a single method?

A. Yes. Authoritative financial literature strongly supports the use of multiple methods. For example, Professor Eugene F. Brigham, a widely respected scholar and finance academician, asserts:

> *In practical work, it is often best to use all three methods - CAPM, bond yield plus risk premium, and DCF - and then apply judgement when the methods produce different results. People experienced in estimating capital costs recognize that both careful analysis and some very fine judgements are required. It would be nice to pretend that these judgements are unnecessary and to specify an easy, precise way of determining the exact cost of equity capital. Unfortunately, this is not possible.*[1]

[1] E.F. Brigham and L.C. Gapenski, Financial Management Theory and Practice, p. 256 (4th ed., Dryden Press, Chicago, 1985).

In a subsequent edition of his best-selling corporate finance textbook, Dr. Brigham discusses the various methods used in estimating the cost of common equity capital, and states:

> *However, three methods can be used: (1) the Capital Asset Pricing Model (CAPM), (2) the discounted cash flow (DCF) model, and (3) the bond-yield-plus-risk-premium approach. These methods should not be regarded as mutually exclusive - no one dominates the others, and all are subject to error when used in practice. Therefore, when faced with the task of estimating a company' cost of equity, we generally use all three methods . . .*[2]

Another prominent finance scholar, Professor Stewart Myers, in his best selling corporate finance textbook, points out: "*The constant growth [DCF] formula and the capital asset pricing model are two different ways of getting a handle on the same problem.*"[3]

In an earlier article, Professor Myers explains:

> *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.*[4]

Q. Does the broad usage of the DCF methodology in past regulatory proceedings indicate that it is superior to other methods?

A. No, it does not. Uncritical acceptance of the standard DCF equation vests the model with a degree of reliability that is simply not justified. One of the leading experts on regulation, Dr. Charles F. Phillips discusses the dangers of relying solely on the DCF model:

> *"[U]se of the DCF model for regulatory purposes involves both theoretical and practical difficulties. The theoretical issues include*

[2] E.F. Brigham and L.C. Gapenski, Financial Management Theory and Practice, p. 348 (8th ed., Dryden Press, Chicago, 2005).

[3] R.A. Brealey and S.C. Myers, Principles of Corporate Finance, p. 182 (3rd ed., McGraw Hill, New York, 1988).

[4] S.C. Myers, "On the Use of Modern Portfolio Theory in Public Utility Rate Cases: Comment," Financial Management, p. 67 (Autumn 1978).

the assumption of a constant retention ratio (i.e. a fixed payout ratio) and the assumption that dividends will continue to grow at a rate 'g' in perpetuity. Neither of these assumptions has any validity, particularly in recent years. Further, the investors' capitalization rate and the cost of equity capital to a utility for application to book value (i.e. an original cost rate base) are identical only when market price is equal to book value. Indeed, DCF advocates assume that if the market price of a utility's common stock exceeds its book value, the allowable rate of return on common equity is too high and should be lowered; and vice versa. 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."

. . . [T]here remains the circularity problem: 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 all of these reasons, the DCF model suggests a degree of precision which is in fact not present and leaves wide room for controversy about the level of k [cost of equity].[5]

Dr. Charles F. Phillips also discusses the dangers of relying solely on the CAPM model because of the lack of realism of certain of its stringent assumptions, as is the case for any model in the social sciences.

Sole reliance on any one model, whether it is DCF, CAPM, or Risk Premium, simply ignores the capital market evidence and investors' use of the other theoretical frameworks. The DCF model is only 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 should supplant other financial theory and market evidence. The same is true of the CAPM.

[5] C.F. Phillips, The Regulation of Public Utilities Theory and Practice (Public Utilities Reports, Inc., 1988) pp. 376-77. [Footnotes omitted.]

Q. Do the assumptions underlying the DCF model require that the model be treated with caution?

A. Yes, particularly in today's rapidly changing utility industry. Even ignoring the fundamental thesis that several methods and/or variants of such methods should be used in measuring equity costs, the DCF methodology, as those familiar with the industry and the accepted norms for estimating the cost of equity are aware, is problematic for use in estimating cost of equity at this time.

Several fundamental structural changes have transformed the energy utility industry since the standard DCF model and its assumptions were developed. For example, deregulation, increased wholesale competition triggered by national policy, accounting rule changes, changes in customer attitudes regarding utility services, the evolution of alternative energy sources, highly volatile fuel prices, and mergers-acquisitions have all influenced stock prices in ways that have deviated substantially from the assumptions of the DCF model. These changes suggest that some of the fundamental assumptions underlying the standard DCF model, particularly that of constant growth and constant relative market valuation, for example price/earnings (P/E) ratios and market-to-book (M/B) ratios, are problematic at this point in time for utility stocks, and that, therefore, alternate methodologies to estimate the cost of common equity should be accorded at least as much weight as the DCF method.

Q. Is the constant relative market valuation assumption inherent in the DCF model always reasonable?

A. No, not always. Caution must be exercised when implementing the standard DCF model in a mechanistic fashion, for it may fail to recognize changes in relative market valuations over time. The traditional DCF model is not equipped to deal with surges in M/B and price-earnings P/E ratios. The standard DCF model assumes a constant market valuation multiple, that is, a constant P/E ratio and a constant M/B ratio. Stated another way, the model assumes that investors expect the ratio of market price to dividends (or earnings) in any given year to be the same as the current ratio of market price to dividend (or earnings), and that the stock price will grow at the same rate as the book value. This is a necessary result of the infinite growth assumption. This assumption is unrealistic under current conditions. The DCF model is not equipped to deal with sudden surges in M/B and P/E ratios, as was experienced by a number of utility stocks in recent years.

In short, caution and judgment are required in interpreting the results of the DCF model because of (1) the effect of changes in risk and growth on natural gas utilities, (2) the disconnect between the tenets of the DCF model and the characteristics of utility stocks in the current capital market environment, and (3) the practical difficulties associated with the growth component of the DCF model. Hence, there is a clear need to go beyond the DCF results and take into account the results produced by alternate methodologies in arriving at a ROE recommendation.

Q. Do the assumptions underlying the CAPM require that the model be treated with caution?

A. Yes, as was the case with the DCF model, the assumptions underlying any model in the social sciences, including the CAPM, are stringent. Moreover, the empirical validity of the CAPM has been the subject of intense research in recent years. Although the CAPM provides useful evidence, it must be complemented by other methodologies as well.

A. CAPM Estimates

Q. Please describe your application of the CAPM risk premium approach.

A. My first two risk premium estimates are based on the CAPM and on an empirical approximation to the CAPM (ECAPM). The CAPM is a fundamental paradigm of finance. The fundamental idea underlying the CAPM is that risk-averse investors demand higher returns for assuming additional risk, and higher-risk securities are priced to yield higher expected returns than lower-risk securities. The CAPM quantifies the additional return, or risk premium, required for bearing incremental risk. It provides a formal risk-return relationship anchored on the basic idea that only market risk matters, as measured by beta. According to the CAPM, securities are priced such that:

EXPECTED RETURN = RISK-FREE RATE + RISK PREMIUM

Denoting the risk-free rate by R_F and the return on the market as a whole by R_M, the CAPM is stated as follows:

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

This is the seminal CAPM expression, which states that the return required by investors is made up of a risk-free component, R_F, plus a risk premium given by β times $(R_M - R_F)$. To derive the CAPM risk premium estimate, three quantities are required: the risk-free rate (R_F), beta (β), and the market risk premium, $(R_M - R_F)$. For the risk-free rate, I used 5.2%, based on the level of long-term interest rates. For beta, I used 0.86 and for the market risk premium I used 7.2%. These inputs to the CAPM are explained below.

Q. What risk-free rate did you use in your CAPM and risk premium analyses?

A. To implement the CAPM and Risk Premium methods, an estimate of the risk-free return is required as a benchmark. As a proxy for the risk-free rate, I have relied on the current level of 30-year Treasury bond yields.

The appropriate proxy for the risk-free rate in the CAPM is the return on the longest term Treasury bond possible. This is because common stocks are very long-term instruments more akin to very long-term bonds rather than to short-term or intermediate-term Treasury notes. In a risk premium model, the ideal estimate for the risk-free rate has a term to maturity equal to the security being analyzed. Since common stock is a very long-term investment because the cash flows to investors in the form of dividends last indefinitely, the yield on the longest-term possible government bonds, that is the yield on 30-year Treasury bonds, is the best measure of the risk-free rate for use in the CAPM. The expected common stock return is based on very long-term cash flows, regardless of an individual's holding time period. Moreover, utility asset investments generally have very long-term useful lives and should correspondingly be matched with very long-term maturity financing instruments.

While long-term Treasury bonds are potentially subject to interest rate risk, this is only true if the bonds are sold prior to maturity. A substantial fraction of bond market participants, usually institutional investors with long-term liabilities (pension funds, insurance companies), in fact hold bonds until they mature, and therefore are not subject to interest rate risk. Moreover, institutional bondholders neutralize the impact of interest rate changes by matching the maturity of a bond portfolio with the investment planning period, or by engaging in hedging transactions in the financial futures markets. The merits and mechanics of such immunization strategies are well documented by both academicians and practitioners.

Another reason for utilizing the longest maturity Treasury bond possible is that common equity has an infinite life span, and the inflation expectations embodied in its market-required rate of return will therefore be equal to the inflation rate anticipated to prevail over the very long-term. The same expectation should be embodied in the risk free rate used in applying the CAPM model. It stands to reason that the yields on 30-year Treasury bonds will more closely incorporate within their yield the inflation expectations that influence the prices of common stocks than do short-term or intermediate-term U.S. Treasury notes.

Among U.S. Treasury securities, 30-year Treasury bonds have the longest term to maturity and the yield on such securities should be used as proxies for the risk-free rate in applying the CAPM, provided there are no anomalous conditions existing in the 30-year Treasury market. In the absence of such conditions, I have relied on the yield on 30-year Treasury bonds in implementing the CAPM and risk premium methods.

Q. Dr. Morin, why did you reject short-term interest rates as a proxies for the risk-free rate in implementing the CAPM?

A. Short-term rates are volatile, fluctuate widely, and are subject to more random disturbances than are long-term rates. Short-term rates are largely administered rates. For example, Treasury bills are used by the Federal Reserve as a policy vehicle to stimulate the economy and to control the money supply, and are used by foreign governments, companies, and individuals as a temporary safe-house for money.

As a practical matter, it makes no sense to match the return on common stock to the yield on 90-day Treasury Bills. This is because short-term rates, such as the yield on 90-day Treasury Bills, fluctuate widely, leading to volatile and unreliable equity return estimates. Moreover, yields on 90-day Treasury Bills typically do not match the equity investor's planning horizon. Equity investors generally have an investment horizon far in excess of 90 days.

As a conceptual matter, short-term Treasury Bill yields reflect the impact of factors different from those influencing the yields on long-term securities such as common stock. For example, the premium for expected inflation embedded into 90-day Treasury Bills is likely to be far different than the inflationary premium embedded into long-term securities yields. On grounds of stability and consistency, the yields on long-term Treasury bonds match more closely with common stock returns.

Q. What is your estimate of the risk-free rate in applying the CAPM?

A. The level of U.S. Treasury 30-year long-term bond yields prevailing in June 2006 as reported in the Value Line Investment Analyzer ("VLIA") June 2006 edition was 5.2%. I therefore used 5.2% as my estimate of the risk-free rate component of the CAPM.

Q. How did you select the beta for your CAPM analysis?

A. A major thrust of modern financial theory as embodied in the CAPM is that perfectly diversified investors can eliminate the company-specific component of risk, and that only market risk remains. The latter is technically known as "beta", or "systematic risk". The beta coefficient measures change in a security's return relative to that of the market. The beta coefficient states the extent and direction of movement in the rate of return on a stock relative to the movement in the rate of return on the market as a whole. The beta coefficient indicates the change in the rate of return on a stock associated with a one percentage point change in the rate of return on the market, and thus measures the degree to which a particular stock shares the risk of the market as a whole. Modern financial theory has established that beta incorporates several economic characteristics of a corporation which are reflected in investors' return requirements.

Of course, as a wholly-owned subsidiary of AGLR, CGC is not publicly traded, and therefore, proxies must be used. Given the Company's relatively small size, it is reasonable to postulate that CGC possesses an investment risk profile that is at least as risky as that of the average risk publicly-traded natural gas distribution utility company. As a conservative proxy for the Company's beta, I have therefore examined the betas of a sample of publicly-traded natural gas distribution utilities contained in the current edition of the VLIA software . In order to minimize the well-known thin trading bias in measuring beta, only those companies whose market capitalization exceeded $500 million were considered. The average beta for the group is 0.86 as shown on page 1 of Exhibit RAM-2.[6] As a second proxy for the Company's natural gas distribution business, I examined the beta for investment-grade combination gas and electric utilities covered by Value Line and AUS Utility Reports. This group is discussed later in my testimony. The average beta of these companies is 0.88, as displayed on page 2 of Exhibit RAM-2, which

[6] The average beta for the group excluding AmeriGas and Southern Union is 0.86.

is reasonably close to the estimate based on natural gas group. Based on these results, I shall use 0.85 as my beta estimate.

Q. What market risk premium estimate did you use in your CAPM analysis?

A. For the market risk premium, I used 7.2%. This estimate was based on the results of both forward-looking and historical studies of long-term risk premiums. First, the Ibbotson Associates study, *Stocks, Bonds, Bills, and Inflation, 2006 Yearbook,* compiling historical returns from 1926 to 2005, shows that a broad market sample of common stocks outperformed long-term U. S. Treasury bonds by 6.5%. The historical market risk premium over the income component of long-term Treasury bonds rather than over the total return is 7.1%.[7] Ibbotson Associates recommend the use of the latter as a more reliable estimate of the historical market risk premium, and I concur with this viewpoint. The historical MRP should be computed using the income component of bond returns because the intent, even using historical data, is to identify an expected market risk premium. The more accurate way to estimate the market risk premium from historic data is to use the *income* return, not *total* returns on government bonds, as explained at page 66 of Ibbotson Associates, Stocks, Bonds, Bills, and Inflation: Valuation Edition, 2005 Yearbook. This is because the income component of total bond return (*i.e.* the coupon rate) is a far better estimate of expected return than the total return (*i.e.* the coupon rate + capital gain), as realized capital gains/losses are largely unanticipated by bond investors.

---

[7] Because 30-year bonds were not always traded or even available throughout the entire 1926-2005 long period covered in the Ibbotson Associate Study of historical returns, the latter study relied on bond return data based on 20-year Treasury bonds. To the extent that the normal yield curve is virtually flat above maturities of 20 years over most of the period covered in the Ibbotson study, the difference in yield is not material. In fact, the difference in yield between 30-year and 20-year bonds is actually negative. The average difference in yield over the 1977-2006 period is 13 basis points, that is, the yield on 20-year bonds is slightly higher than the yield on 30-year bonds.

The long-horizon (1926-2005) market risk premium (based on income returns, as required) is specifically calculated to be 7.1% rather than 6.5%.

Second, a DCF analysis applied to the aggregate equity market using Value Line's aggregate stock market index and growth forecasts indicates a prospective market risk premium of 7.3%, almost the same as the historical estimate. The average of the historical (7.1%) and prospective estimates (7.3%), which is 7.2%, provides a reasonable estimate of the market risk premium.

Q. Why did you use long time periods in arriving at your historical market risk premium estimate?

A. Because realized returns can be substantially different from prospective returns anticipated by investors when measured over short time periods, it is important to employ returns realized over long time periods rather than returns realized over more recent time periods when estimating the market risk premium with historical returns. Therefore, a risk premium study should consider the longest possible period for which data are available. Short-run periods during which investors earned a lower risk premium than they expected are offset by short-run periods during which investors earned a higher risk premium than they expected. Only over long time periods will investor return expectations and realizations converge.

I have therefore ignored realized risk premiums measured over short time periods, since they are heavily dependent on short-term market movements. Instead, I relied on results over periods of enough length to smooth out short-term aberrations, and to encompass several business and interest rate cycles. The use of the entire study period in estimating the appropriate market risk premium minimizes subjective judgment and encompasses many diverse regimes of inflation, interest rate cycles, and economic cycles.

To the extent that the estimated historical equity risk premium follows what is known in statistics as a random walk, one should expect the equity risk premium to remain at its historical mean. The best estimate of the future risk premium is the historical mean. Since I found no evidence that the market price of risk or the amount of risk in common stocks has changed over time, that is, no significant serial correlation in the Ibbotson study, it is reasonable to assume that these quantities will remain stable in the future.

Q. Please describe your prospective approach in deriving the market risk premium in the CAPM analysis.

A. For my prospective estimate of the market risk premium, I applied a DCF analysis to the aggregate equity market using Value Line's VLIA software. The dividend yield on the dividend-paying stocks that make up the Value Line Composite index made up of some 1800 stocks is currently 1.24% (VLIA 06/2006 edition), and the average projected dividend growth rate is 10.92%. Adding the dividend yield to the growth component produces an expected return on the aggregate equity market of 12.16%. Following the tenets of the DCF model, the spot dividend yield must be converted into an expected dividend yield by multiplying it by one plus the growth rate. This brings the expected return on the aggregate equity market to 12.30%. Recognition of the quarterly timing of dividend payments rather than the annual timing of dividends assumed in the annual DCF model brings the market risk premium estimate to approximately 12.50%. Subtracting the risk-free rate of 5.2% from the latter, the implied risk premium is 7.3% over long-term U.S. Treasury bonds. The average of the historical (7.1%) and prospective market risk premium (7.3%) estimates is 7.2%.

As a check on my market risk premium estimate, I examined a recent 2003 comprehensive article published in Financial Management, Harris, Marston, Mishra, and O'Brien ("HMMO") that provides estimates of the ex ante expected returns for S&P 500 companies over the period 1983-1998.[8] HMMO measure the expected rate of return (cost of equity) of each dividend-paying stock in the S&P 500 for each month from January 1983 to August 1998 by using the constant growth DCF model. The prevailing risk-free rate for each year was then subtracted from the expected rate of return for the overall market to arrive at the market risk premium for that year. The table below, drawn from HMMO Table 2, displays the average prospective risk premium estimate for each year from 1983 to 1998. The average market risk premium estimate for the overall period is 7.2%, which is reasonably very close to my own estimate of 7.3%.

Year	DCF Market Risk Premium
1983	6.6%
1984	5.3%
1985	5.7%
1986	7.4%
1987	6.1%
1988	6.4%
1989	6.6%
1990	7.1%
1991	7.5%
1992	7.8%
1993	8.2%
1994	7.3%
1995	7.7%
1996	7.8%
1997	8.2%
1998	9.2%
MEAN	**7.2%**

[8] Harris, R.S., Marston, F.C., Mishra, D.R., and O'Brien, T.J., "*Ex Ante* Cost of Equity Estimates of S&P 500 Firms: The Choice Between Global and Domestic CAPM," Financial Management, Autumn 2003, pp. 51-66.

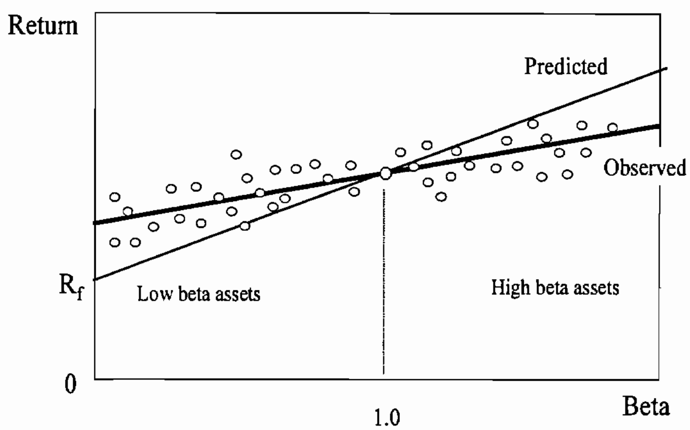
Q. What is your risk premium estimate of the Company's cost of equity using the CAPM approach?

A. Inserting those input values in the CAPM equation, namely a risk-free rate of 5.2%, a beta of 0.86, and a market risk premium of 7.2%, the CAPM estimate of the cost of common equity is: 5.2% + 0.86 x 7.2% = 11.4%. This estimate becomes 11.7% with flotation costs, discussed later in my testimony.

Q. What is your risk premium estimate using the empirical version of the CAPM?

A. With respect to the empirical validity of the plain vanilla CAPM, there have been countless empirical tests of the CAPM to determine to what extent security returns and betas are related in the manner predicted by the CAPM. This literature is summarized in Chapter 13 of my book, Regulatory Finance, published by Public Utilities Report Inc. The results of the tests support the idea that beta is related to security returns, that the risk-return tradeoff is positive, and that the relationship is linear. The contradictory finding is that the risk-return tradeoff is not as steeply sloped as the predicted CAPM. That is, empirical research has long shown that low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. A CAPM-based estimate of cost of capital underestimates the return required from low-beta securities and overstates the return required from high-beta securities, based on the empirical evidence. This is one of the most well-known results in finance, and it is displayed graphically below.

CAPM: Predicted vs Observed Returns



A number of variations on the original CAPM theory have been proposed to explain this finding. The ECAPM makes use of these empirical findings. The ECAPM estimates the cost of capital with the equation:

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

where $\acute{\alpha}$ is the "alpha" of the risk-return line, a constant, MRP is the market risk premium ($R_M - R_F$), and the other symbols are defined as usual. Inserting the long-term risk-free rate as a proxy for the risk-free rate, an alpha in the range of 1% - 2%, and reasonable values of beta and the MRP in the above equation produces results that are indistinguishable from the following ECAPM expression:

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

An alpha range of 1% - 2% is somewhat lower than that estimated empirically. The use of a lower value for alpha leads to a lower estimate of the cost of capital for low-beta stocks such as regulated utilities. This is because the use of a long-term risk-free rate rather than a short-term risk-free rate already incorporates some of the desired effect of using the ECAPM. That is, the long-term risk-free rate version of the CAPM has a higher intercept and a flatter slope than the short-term risk-free version which has been tested. This is also because the use of adjusted betas rather than raw betas also incorporate some of the desired effect of using the ECAPM. Thus, it is reasonable to apply a conservative alpha adjustment.

Q. Is the use of the ECAPM consistent with the use of adjusted betas?

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

Appendix A contains a full discussion of the ECAPM, including its theoretical and empirical underpinnings. In short, the following equation provides a viable approximation to the observed relationship between risk and return, and provides the following cost of equity capital estimate:

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

Inserting 5.2% for the risk-free rate R_F, a market risk premium of 7.2% for (R_M - R_F) and a beta of 0.86 in the above equation, the return on common equity is 11.6% without flotation costs and 11.9% with flotation costs.

B. <u>Risk Premium Estimates</u>

Q. Please describe your historical risk premium analysis of the natural gas utility industry.

A. An historical risk premium for the natural gas utility industry was estimated with an annual time series analysis applied to the natural gas utility industry as a whole, using Moody's Natural Gas Distribution Index as an industry proxy. The analysis is depicted on Exhibit RAM-3. The risk premium was estimated by computing the actual return on equity capital for Moody's Index for each year from 1955 to 2001 using the actual stock prices and dividends of the index, and then subtracting the long-term government bond return for that year. Data for this particular index was unavailable for periods prior to 1955 and data beyond 2001 were not readily available following the acquisition of Moody's by Mergent.

As shown on Exhibit RAM-3, the average risk premium over the period was 5.7% over long-term Treasury bonds. Given the risk-free rate of 5.2%, the implied cost of equity from this particular method is 5.2% + 5.7% = 10.9% without flotation costs and 11.2% with flotation costs.

Q. Please describe your historical risk premium analysis of the electric utility industry.

A. As a check on the historical risk premium estimate obtained from the natural gas utility industry, I examined the historical risk premium inherent in the electric utility industry. The advantage of this method is that historical data are available over a much longer historical period for the electric utility than was the case for the natural gas industry, thereby enhancing the statistical reliability of the estimate. Moreover, it is reasonable to postulate that CGC's natural gas business possesses an investment risk profile similar to that of the electricity delivery business. Over most of the historical period covered by this study for which data are readily available, namely 1927-2001, the electric utility business provides a reasonable proxy for the natural gas distribution business because it possessed economic characteristics similar to those of natural gas distribution utilities, enjoyed the same umbrella of protection as a regulated monopoly utility, and enjoyed virtually identical allowed rates of return over that period, attesting to the risk comparability.

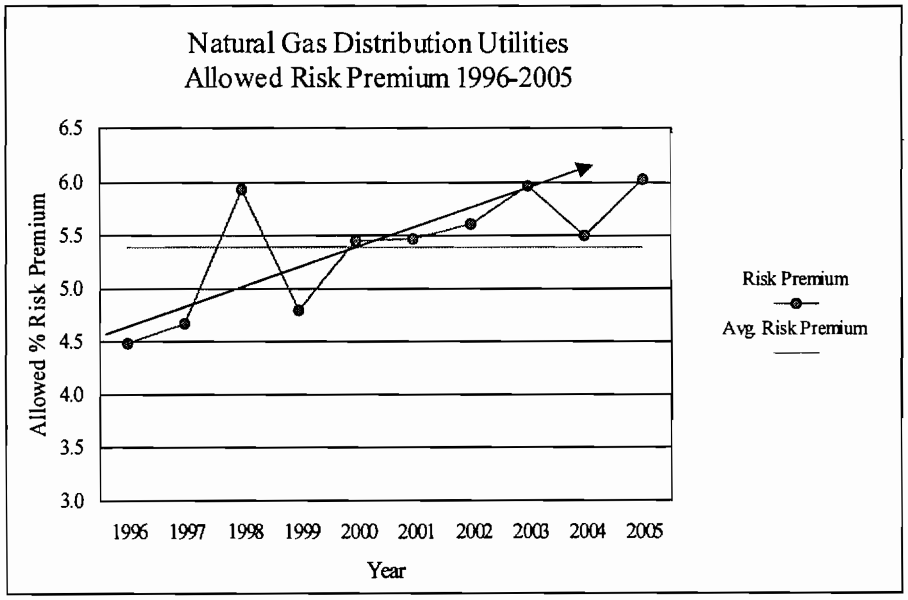
Therefore, a historical risk premium for the electric utility industry was estimated with an annual time series analysis applied to the electric utility industry as a whole, using Moody's Electric Utility Index as an industry proxy. The analysis is depicted on pages 2 and 3 of Exhibit RAM-3. The risk premium was estimated by computing the actual return on equity capital for Moody's Index for each year using the actual stock prices and dividends of the index, and then subtracting the long-term Treasury bond return for that year. The average risk premium over the period was 5.6% over long-term Treasury bonds. Given that the risk-free rate is 5.2%, the implied cost of equity for the average electric utility from this particular method is 5.2% + 5.6% = 10.8% without flotation costs and 11.1% with flotation costs. This result is virtually identical to the natural gas industry estimate.

Both the historical risk premium analyses for the natural gas and electric utility industries stop in 2001 because the annual Moody's Public Utility Manual from which the data were drawn was discontinued following the acquisition of Moody's by Mergent in 2002. In view of the rising risk premium allowed by regulators documented in the next section of my testimony, it would not be unreasonable to expect that the current utility risk premium exceeds the historical average. I did examine some more recent historical bond return and equity return data based on the S&P Utility Index instead of Moody's Electric Utility Index. The addition of 2002-2005 data actually raises the historical risk premium slightly. This is not surprising in view of the rising utility equity market during the 2003-2005 period.

C. <u>Allowed Risk Premiums</u>

Q. Please describe your analysis of allowed risk premiums in the natural gas utility industry.

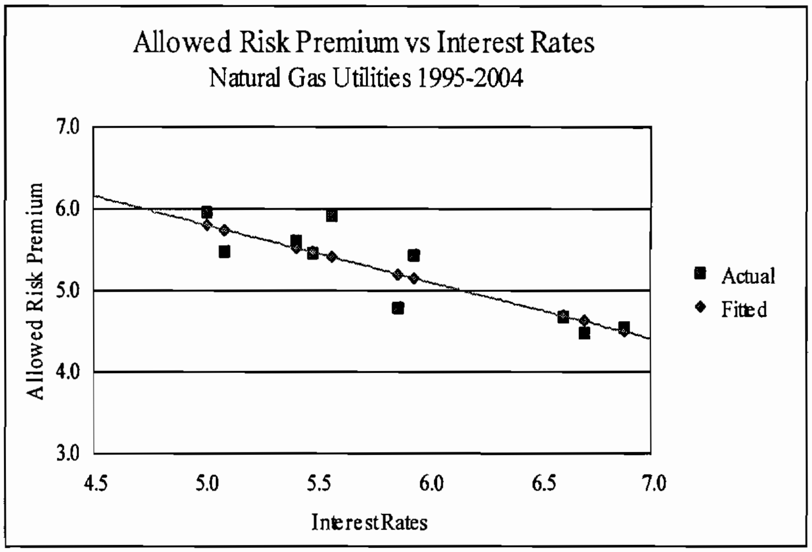
A. To estimate the Company's cost of common equity, I also examined the historical risk premiums implied in the ROE allowed by regulatory commissions for natural gas utilities over the last decade relative to the contemporaneous level of the long-term Treasury bond yield. This variation of the risk premium approach is reasonable because allowed risk premiums are presumably based on the results of market-based methodologies presented to regulators in rate hearings and on the actions of objective unbiased investors in a competitive marketplace. Historical allowed ROE data are readily available over long periods on a quarterly basis from Regulatory Research Associates. The average ROE spread over long-term Treasury yields was 5.4% for the 1996-2005 time period, as shown by the horizontal line in the graph below. The graph also shows the year-by-year allowed risk premium. The steady escalating trend of the risk premium in response to lower interest rates and rising competition and restructuring is noteworthy.



A careful review of these ROE decisions relative to interest rate trends reveals a narrowing of the risk premium in times of rising interest rates, and a widening of the premium as interest rates fall. The following statistical relationship between the risk premium (RP) and interest rates (YIELD) emerges over the last decade:

$$RP = 9.2403 - 0.6860\ YIELD \qquad R^2 = 0.74$$
$$(t = 4.8)$$

The relationship is highly statistically significant[9] as indicated by the high R^2 and statistically significant t-value of the slope coefficient. The graph below shows a clear inverse relationship between the allowed risk premium and interest rates as revealed in past ROE decisions.



Inserting the current long-term Treasury bond yield of 5.2% in the above equation suggests that a risk premium estimate of 5.7% should be allowed for the average risk natural gas utility, implying a cost of equity of 10.9% for the average risk utility.

Q. **Please summarize your risk premium estimates.**

A. The table below summarizes the ROE estimates obtained from the risk premium studies. The average risk premium result is 11.4%.

[9] The coefficient of determination R^2, sometimes called the "goodness of fit measure" is a measure of the degree of explanatory power of a statistical relationship. It is simply the ratio of the explained portion to the total sum of squares. The higher R^2 the higher is the degree of the overall fit of the estimated regression equation to the sample data. The t-statistic is a standard measure of the statistical significance of an independent variable in a regression relationship. A t-value above 2.0 is considered highly significant.

Risk Premium Method	% ROE
CAPM	11.7%
Empirical CAPM	11.9%
Risk Premium Natural Gas	11.2%
Allowed Risk Premium	10.9%
AVERAGE	**11.4%**

D. DCF Estimates

Q. Please describe the DCF approach to estimating the cost of equity capital.

A. According to DCF theory, the value of any security to an investor is the expected discounted value of the future stream of dividends or other benefits. One widely used method to measure these anticipated benefits in the case of a non-static company is to examine the current dividend plus the increases in future dividend payments expected by investors. This valuation process can be represented by the following formula, which is the traditional DCF model:

$$K_e = D_1/P_o + g$$

where: K_e = investors' expected return on equity

D_1 = expected dividend at the end of the coming year

P_o = current stock price

g = expected long-term growth rate of dividends, earnings, book value, stock price

The traditional DCF formula states that under certain assumptions, which are described in the next paragraph, the equity investor's expected return, K_e, can be viewed as the sum of an expected dividend yield, D_1/P_o, plus the expected growth rate of future dividends and stock price, g. The returns anticipated at a given market price are not directly observable and must be estimated from statistical market information. The idea of the market value approach is to infer 'K_e' from the observed share price, the observed dividend, and an estimate of investors' expected future growth.

The assumptions underlying this valuation formulation are well known, and are discussed in detail in Chapter 4 of my reference book, Regulatory Finance. The traditional DCF model requires the following main assumptions: a constant average growth trend for both dividends and earnings, a stable dividend payout policy, a discount rate in excess of the expected growth rate, and a constant price-earnings multiple, which implies that growth in price is synonymous with growth in earnings and dividends. The traditional DCF model also assumes that dividends are paid at the end of each year when in fact dividend payments are normally made on a quarterly basis.

Q. How did you estimate the Company's cost of equity with the DCF model?

A. I applied the DCF model to two proxies for CGC: a group of actively-traded dividend-paying natural gas distribution companies drawn from the Value Line Gas Distribution Group and a group of investment-grade dividend-paying combination gas and electric utilities drawn from AUS Utility Reports. These are essentially the same two groups examined earlier to estimate a proper beta risk measure for CGC.

In order to apply the DCF model, two components are required: the expected dividend yield (D_1/P_o) and the expected long-term growth (g). The expected dividend D_1 in the annual DCF model can be obtained by multiplying the current indicated annual dividend rate by the growth factor (1 + g).

From a conceptual viewpoint, the stock price to employ in calculating the dividend yield is the current price of the security at the time of estimating the cost of equity. The reason is that current stock prices provide a better indication of expected future prices than any other price in an efficient market. An efficient market implies that prices adjust rapidly to the arrival of new information. Therefore, current prices reflect the fundamental economic value of a security. A considerable body of empirical evidence indicates that capital markets are efficient with respect to a broad set of information. This implies that observed current prices represent the fundamental value of a security, and that a cost of capital estimate should be based on current prices.

In implementing the DCF model, I have used the dividend yields reported in the June 2006 edition of Value Line's VLIA. Basing dividend yields on average results from a large group of companies reduces the concern that vagaries of individual company stock prices will produce an unreliable dividend yield.

Q. How did you estimate the growth component of the DCF model?

A. The principal difficulty in calculating the required return by the DCF approach is in ascertaining the growth rate that investors currently expect. Since no explicit estimate of expected growth is observable, proxies must be employed.

As proxies for expected growth, I examined growth estimates developed by professional analysts employed by large investment brokerage institutions. Projected long-term growth rates actually used by institutional investors to determine the desirability of investing in different securities influence investors' growth anticipations. These forecasts are made by large reputable organizations, and the data are readily available to investors and are representative of the consensus view of investors. Because of the dominance of institutional investors in investment management and security selection, and their influence on individual investment decisions, analysts' growth forecasts influence investor growth expectations and provide a sound basis for estimating the cost of equity with the DCF model. Growth rate forecasts of several analysts are available from published investment newsletters and from systematic compilations of analysts' forecasts, such as those tabulated by Zacks Investment Research Inc. ("Zacks"). I used analysts' long-term growth forecasts contained in Zacks (also reported in Value Line's VLIA software) as proxies for investors' growth expectations in applying the DCF model. I also used Value Line's own growth forecast as an additional proxy.

Q. Why did you reject the use of historical growth rates in applying the DCF model to gas and electric utilities?

A. Historical growth rates have questionable relevance as proxies for future long-term growth. They are downward-biased by the sluggish earnings performance in the last five years, due to the structural transformation of the energy utility industry from a regulated monopoly to a more competitive environment. Moreover, historical growth rates are somewhat redundant because such historical growth patterns are already incorporated in analysts' growth forecasts that should be used in the DCF model.

Q. Did you consider dividend growth proxies in applying the DCF model?

A. No, not at this time. This is because it is widely expected that natural gas and electric utilities will continue to lower their dividend payout ratio over the next several years in response to increased risk and increased competition and its potential impact on the revenue stream. In other words, earnings and dividends are not expected to grow at the same rate in the future. According to the latest edition of Value Line, the expected dividend growth of 3.5% for the natural gas proxy group is substantially less than the expected earnings growth of 5.6% over the next few years.

Whenever the dividend payout ratio is expected to change, the intermediate growth rate in dividends cannot equal the long-term growth rate, because dividend/earnings growth must adjust to the changing payout ratio. The assumptions of constant perpetual growth and constant payout ratio are clearly not met. The implementation of the standard DCF model is of questionable relevance in this circumstance.

Dividend growth rates are unlikely to provide a meaningful guide to investors' growth expectations for natural gas and electric utilities. This is because utilities' dividend policies have become increasing conservative as business risks in the industry have intensified steadily. Dividend growth has remained largely stagnant in past years as utilities are increasingly conserving financial resources in order to hedge against rising business risks. The dividend payout ratios of energy utilities has steadily decreased over last decade. As a result, investors' attention has shifted from dividends to earnings. Therefore, earnings growth provides a more meaningful guide to investors' long-term growth expectations. After all, it is growth in earnings that will support future dividends and share prices.

Q. Is there any empirical evidence documenting the importance of earnings in evaluating investors' expectations in the investment community?

A. Yes, there is an abundance of evidence attesting to the importance of earnings in assessing investors' expectations. First, the sheer volume of earnings forecasts available from the investment community relative to the scarcity of dividend forecasts attests to their importance. To illustrate, Value Line, Zacks, First Call Thompson, and Multex provide comprehensive compilations of investors' earnings forecasts, to name some. 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. Second, surveys of analytical techniques actually used by analysts reveal the dominance of earnings and conclude that earnings are considered far more important than dividends. Third, Value Line's principal investment rating assigned to individual stocks, Timeliness Rank, is based primarily on earnings, accounting for 65% of the ranking.

Q. What DCF results did you obtain for the natural gas utilities group?

A. As a proxy for CGC, I have examined the expected returns of dividend-paying natural gas distribution utilities contained in Value Line's natural gas distribution universe with a market value in excess of $500 million. The group is shown in Exhibit RAM-4. Keyspan Corp was excluded from the group on account of ongoing acquisition negotiations with National Grid.

As shown on Column 3 of Exhibit RAM-4, the average long-term growth forecast obtained from the Zacks corporate earnings database is 5.3% for the natural gas distribution group.[10] Combining this growth rate with the average expected dividend yield of 4.1% shown in Column 4 produces an estimate of equity costs of 9.4% for the gas distribution group. Recognition of flotation costs brings the cost of equity estimate to 9.6%, shown in Column 6.

[10] No growth estimate was available for Laclede Gas.

Repeating the exact same procedure, only this time using Value Line's long-term earnings growth forecast of 5.6% instead of the Zacks consensus growth forecast, the cost of equity for gas distribution group is 9.9%, unadjusted for flotation costs. Adding an allowance for flotation costs brings the cost of equity estimate to 10.1%. This analysis is displayed on Exhibit RAM-5.

Q. Please describe your second proxy group for the Company's natural gas distribution business?

A. As a second proxy for the Company's natural gas distribution business, I examined a group of investment-grade combination gas and electric utilities. The latter possess economic characteristics similar to those of natural gas distribution utilities, notwithstanding their larger size. They are both involved in the distribution of energy services products at regulated rates in a cyclical and weather-sensitive market. They both employ a capital-intensive network with similar physical characteristics. They are both subject to rate of return regulation.

Therefore, my second group of companies as a proxy for the Company's natural gas business consists of investment-grade combination gas and electric utilities covered in the AUS Utility Reports, May 2006. Companies below investment-grade, that is, companies with a bond rating below Baa3, were eliminated as well as those companies without Value Line coverage. Moreover, given CGC's relatively small size relative to these companies, it is reasonable to postulate that the Company's natural gas distribution business possesses an investment risk profile that is at least as risky as investment-grade combination gas and electric utilities. The final sample is shown on Page 1 of Exhibit RAM-6.

Q. What DCF results did you obtain for the combination gas and electric utilities group using the Value Line growth projections?

A. For purposes of conducting the DCF analysis, as shown on Page 1 of Exhibit RAM-6, two companies were eliminated from the DCF analysis: Public Service Enterprise Group which is presently involved with merger negotiations, and TECO with an unsustainable growth rate of 19%. As shown on Column 2 of page 2 of Exhibit RAM-6, the average long-term growth forecast obtained from Value Line is 5.9% for this group. Combining this growth rate with the average expected dividend yield of 4.2% shown in Column 3 produces an estimate of equity costs of 10.1% for the group, unadjusted for flotation costs. Adding an allowance for flotation costs to the results of Column 4 brings the cost of equity estimate to 10.3%, shown in Column 5.

Q. What DCF results did you obtain for the combination gas and electric utilities group using the analysts' consensus growth forecast?

A. From the original sample of 20 companies shown on page 1 of Exhibit RAM-6, CH Energy, MGE Energy, and UniSource Energy were eliminated as no analysts' growth forecasts were available from Zacks, and Public Service Enterprise Group was also discarded on account of ongoing merger negotiations. For the remaining 16 companies, using the consensus analysts' earnings growth forecast published by Zacks of 6.1% instead of the Value Line forecast, the cost of equity for the group is 10.4%. Allowance for flotation costs brings the cost of equity estimate to 10.6%. This analysis is shown on page 2 of Exhibit RAM-7.

Q. Please summarize your DCF estimates.

A. The table below summarizes the DCF estimates. The average DCF result is 10.2%.

DCF STUDY	ROE
Natural Gas Distribution Zacks Growth	9.6%
Natural Gas Distribution Value Line Growth	10.1%
Combination Gas & Elec Utilities Zacks Growth	10.6%
Combination Gas & Elec Utilities Value Line Growth	10.3%
AVERAGE	**10.2%**

E. Need for Flotation Cost Adjustment

Q. Please describe the need for a flotation cost allowance.

A. All the market-based estimates reported above include an adjustment for flotation expenses. The simple fact of the matter is that common equity capital is not free. Flotation costs associated with stock issues are exactly like the flotation costs associated with bonds and preferred stocks. Flotation costs are not expensed at the time of issue, and therefore must be recovered via a rate of return adjustment. This is done routinely for bond and preferred stock issues by most regulatory commissions, including FERC. Clearly, the common equity capital accumulated by the Company is not cost-free. The flotation cost allowance to the cost of common equity capital is discussed and applied in most corporate finance textbooks; it is unreasonable to ignore the need for such an adjustment.

Flotation costs are very similar to the closing costs on a home mortgage. In the case of issues of new equity, flotation costs represent the discounts that must be provided to place the new securities. Flotation costs have a direct and an indirect component. The direct component is the compensation to the security underwriter for his marketing/consulting services, for the risks involved in distributing the issue, and for any operating expenses associated with the issue (printing, legal, prospectus, etc.). The indirect component represents the downward pressure on the stock price as a result of the increased supply of stock from the new issue. The latter component is frequently referred to as "market pressure."

Investors must be compensated for flotation costs on an ongoing basis to the extent that such costs have not been expensed in the past, and therefore the adjustment must continue for the entire time that these initial funds are retained in the firm. Appendix B to my testimony discusses flotation costs in detail, and shows: (1) why it is necessary to apply an allowance of 5% to the dividend yield component of equity cost by dividing that yield by 0.95 (100% - 5%) to obtain the fair return on equity capital; (2) why the flotation adjustment is permanently required to avoid confiscation even if no further stock issues are contemplated; and (3) that flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years.

By analogy, in the case of a bond issue, flotation costs are not expensed but are amortized over the life of the bond, and the annual amortization charge is embedded in the cost of service. The flotation adjustment is also analogous to the process of depreciation, which allows the recovery of funds invested in utility plant. The recovery of bond flotation expense continues year after year, irrespective of whether the Company issues new debt capital in the future, until recovery is complete, in the same way that the recovery of past investments in plant and equipment through depreciation allowances continues in the future even if no new construction is contemplated. In the case of common stock that has no finite life, flotation costs are not amortized. Thus, the recovery of flotation cost requires an upward adjustment to the allowed return on equity.

A simple example will illustrate the concept. A stock is sold for $100, and investors require a 10% return, that is, $10 of earnings. But if flotation costs are 5%, the company nets $95 from the issue, and its common equity account is credited by $95. In order to generate the same $10 of earnings to the shareholders, from a reduced equity base, it is clear that a return in excess of 10% must be allowed on this reduced equity base, here 10.52%.

According to the empirical finance literature discussed in Appendix B, total flotation costs amount to 4% for the direct component and 1% for the market pressure component, for a total of 5% of gross proceeds. This in turn amounts to approximately 30 basis points, depending on the magnitude of the dividend yield component. To illustrate, dividing the average expected dividend yield of around 5.0% for utility stocks by 0.95 yields 5.3%, which is 30 basis points higher.

Sometimes, the argument is made that flotation costs are real and should be recognized in calculating the fair return on equity, but only at the time when the expenses are incurred. In other words, the flotation cost allowance should not continue indefinitely, but should be made in the year in which the sale of securities occurs, with no need for continuing compensation in future years. This argument is valid only if the company has already been compensated for these costs. If not, the argument is without merit. My own recommendation is that investors be compensated for flotation costs on an on-going basis rather than through expensing, and that the flotation cost adjustment continue for the entire time that these initial funds are retained in the firm.

There are several sources of equity capital available to a firm including: common equity issues, conversions of convertible preferred stock, dividend reinvestment plan, employees' savings plan, warrants, and stock dividend programs. Each carries its own set of administrative costs and flotation cost components, including discounts, commissions, corporate expenses, offering spread, and market pressure. The flotation cost allowance is a composite factor that reflects the historical mix of sources of equity. The allowance factor is a build-up of historical flotation cost adjustments associated and traceable to each component of equity at its source. It is impractical and prohibitively costly to start from the inception of a company and determine the source of all present equity. A practical solution is to identify general categories and assign one factor to each category. My recommended flotation cost allowance is a weighted average cost factor designed to capture the average cost of various equity vintages and types of equity capital raised by the Company.

Q. Is a flotation cost adjustment required for an operating subsidiary like CGC that does not trade publicly?

A. Yes, it is. It is sometimes alleged that a flotation cost allowance is inappropriate if the utility is a subsidiary whose equity capital is obtained from its parent, in this case, AGLR. This objection is unfounded since the parent-subsidiary relationship does not eliminate the costs of a new issue, but merely transfers them to the parent. It would be unfair and discriminatory to subject parent shareholders to dilution while individual shareholders are absolved from such dilution. Fair treatment must consider that, if the utility-subsidiary had gone to the capital markets directly, flotation costs would have been incurred.

III.
SUMMARY AND RECOMMENDATION ON COST OF EQUITY

Q. Please summarize your results and recommendation.

A. To arrive at my final recommendation, I performed four risk premium analyses. For the first two risk premium studies, I applied the CAPM and an empirical approximation of the CAPM using current market data. The other two risk premium analyses were performed on historical and allowed risk premium data from the natural gas distribution industry aggregate data. I also performed DCF analyses on two surrogates for CGC: a group representative of the natural gas distribution utility industry, and a group of investment-grade combination gas and electric utilities.

The average result from the three principal methodologies is as follows:

CAPM	11.8%
Risk Premium	11.1%
DCF	10.2%
AVERAGE	11.0%

The overall average result is 11.0% for the average risk utility.

Q. Did you adjust these results to account for the fact that CGC is riskier than the average natural gas distribution utility?

A. Yes, I have. The cost of equity estimates derived from the various comparable groups reflect the risk of the average natural gas distribution utility. To the extent that these estimates are drawn from a group of less risky and larger companies, the expected equity return applicable to the riskier CGC is downward-biased. CGC's particular investment risks are discussed below. I estimate the bias to be at least 50 basis points. I therefore have increased my ROE estimate of 11.0% for the average risk natural gas distribution utility to 11.5% in order to account for CGC's higher relative risks.

Q. Please comment on the particular investment risks faced by CGC.

A. Not only is CGC a relatively small utility, but the demand risks faced by CGC are higher than those of other gas distribution utilities. Though it is true that unlike several LDCs in the industry, CGC does not have overlapping service territories with other LDCs and faces limited competition in the industrial market, the Company faces competition from electricity, oil, coal, and propane in its predominantly residential and commercial market.

The direct competition is especially severe and aggressive from electricity for two reasons. First, in the region of Tennessee where the Company operates, electricity prices are highly competitive. Second, the heat load in the residential market areas it services is materially less than that for most gas distribution utilities in the country. These factors, combined with sustained high gas prices and aging appliances ripe for replacement, render electricity a viable alternative. In fact, the usage per residential customer has declined and continues to decline; CGC is experiencing an annual decline in revenues due to chronic 2% declining use of natural gas per customer. In a nutshell, the demand for increased gas volumes is virtually non-existent and has been declining, and as a result the Company's demand risks exceed those of the industry.

Q. Please comment on the financial risks faced by CGC at this time.

A. Because of its relatively small size, in my judgment, CGC's financial risks are higher than those of the industry. CGC possesses small revenue and asset bases, both in absolute terms and relative to other utilities. Investment risk increases as company size diminishes, other variables remaining constant. The size phenomenon is well documented in the finance literature. Small companies have very different returns than large ones and, on average, those returns have been higher. The greater risk of small stocks does not fully account for their higher returns over many historical periods. The average small stock premium is in excess of 5% over the average stock, more than could be expected by risk differences alone, suggesting that the cost of equity for small stocks is considerably larger than for large-capitalization stocks. In addition to earning the highest average rates of return, small stocks also have the highest volatility, as measured by the standard deviation of returns.

In conclusion, in my judgment, CGC's total investment risk is higher than that of the industry at this time, both on account of its small size and the particular demand risk it faces. In order to account for these increased risks, I have increased my recommended return by approximately 50 basis points, that is, from 11.0% for the average risk natural gas utility to 11.5% in order to reflect CGC's higher relative risk. The 50 basis points adjustment is based on utility bond yield spread differentials between A-rated and Baa-rated bonds and on observed beta differentials.

The CAPM formula also was referenced to approximate the return (cost of equity) differences implied by the differences in the betas between the average natural gas utility company and CGC. The basic form of the CAPM, as discussed earlier in my testimony, states that the return differential is given by the differential in beta times the market risk premium, $(R_M - R_F)$. Because I consider CGC's beta to be approximately 0.07 higher than the natural gas industry utility average, the return differential implied by the difference of

0.07 in beta is given by 0.07 times (R_M - R_F). Using an estimate of 7.2% for (R_M - R_F), the return adjustment is close to 50 basis points.

Q. How is the Company proposing to address its above average demand risk?

A. As a result of declining demand and conservation, CGC's base revenue has and will continue to decrease, while at the same time the Company continues to invest in non-revenue producing infrastructure. As a result, the Company's base revenue will decline and the Company will be less likely to earn its authorized fair and reasonable rate of return. In order to address the base revenue instability caused by declines in customer usage from conservation and in order to align its financial interests with that of its customers, the Company is proposing to recover lost base revenue through a Conservation and Usage Adjustment rider ("CUA"). This mechanism will provide base-revenue stability for the Company and remove any disincentive to promote energy conservation.

Moreover, in order to operate its system more efficiently, reduce the escalation of maintenance costs, and increase system safety, the Company is proposing that non-revenue producing pipe replacement costs be recovered separate from base rates through a tracker mechanism ("PRP"). In the absence of such a tracker, CGC will be required to file frequently for rate relief, increasing the Company's operating expenses and regulatory risk. Moreover, approval of the PRP tracker would remove external financial pressures and reduce financial as well as regulatory risk.

Q. Would the adoption of these two mechanisms impact the Company's risk and its cost of common equity?

A. Yes, I believe it would. If the proposed CUA and PRP mechanisms are approved, the Company's risk will be reduced, and the cost of common equity capital likely will decline by some 50 basis points from 11.5% to 11.0%. This assessment is based on bond yield differentials and beta risk differentials, as discussed above.

Q. Dr. Morin, what is your final conclusion regarding CGC's cost of common equity capital?

A. Based on the results of all my analyses, the application of my professional judgment, and the risk circumstances of CGC, it is my opinion that a just and reasonable return on the common equity capital of CGC's natural gas distribution operations in the State of Tennessee at this time is 11.5%. If the proposed CUA and PRP mechanisms are approved, the Company's risk will be reduced, and the cost of common equity capital likely will decline to 11.0%.

Q. Dr. Morin, what capital structure assumption underlies your recommended return on CGC's common equity capital?

A. My recommended return on common equity for CGC is predicated on the adoption of the AGL's approximate test year capital structure consisting of 50% common equity capital and 50% long-term debt capital.

Q. Did you examine the reasonableness of the Company's test year capital structure?

A. Yes, I did. I examined the actual capital structures of comparable risk investor-owned natural gas LDCs. As shown on Exhibit RAM-8, the median common equity ratio of comparable risk natural gas LDCs, the same group of companies used earlier in my testimony when applying the DCF model and estimating beta coefficients, is 50.2%.

Finally, I have compared the Company's test-year debt ratio of 50% to the capital structure benchmark contained in Standard & Poor's Rating Criteria for electric and gas utilities. The debt ratio benchmark for a single "A" bond rating is 43.0% to 49.5% for a utility with a Business Risk Position of 4.0, the same as Atlanta Gas Light, CGC's sister operating natural gas utility. Of course, CGC has no bond rating assigned by bond rating agencies in view of its small size. The 50% test-year debt ratio lies slightly outside the benchmark for a strong single "A" bond rating, which I consider optimal from both ratepayers and utilities with the same business investors' viewpoints.

If the TRA imputes a capital structure consisting of substantially more (less) debt than the test year capital structure, the higher (lower) common equity cost rate related to a changed common equity ratio should be reflected in the approach. If the TRA ascribes a capital structure different from the test-year capital structure, which, for example, imputes a higher debt amount, the repercussions on equity costs must be recognized. It is a rudimentary tenet of basic finance that the greater the amount of financial risk borne by common shareholders, the greater the return required by shareholders in order to be compensated for the added financial risk imparted by the greater use of senior-debt financing. In other words, the greater the debt ratio, the greater is the return required by equity investors. Both the cost of incremental debt and the cost of equity must be adjusted to reflect the additional risk associated with the more debt-heavy capital structure. Lower common equity ratios imply greater risk and higher capital cost, and vice versa.

Q. What is the resulting capital structure, including short-term debt, based on your hypothetical 50/50 long-term component ratio?

A. As described in further detail in the direct testimony of Company witness Morley, the resulting capital structure, including short-term debt is 7.23 % short-term debt and 46.38% for long-term debt and common equity. This 46.38% common equity ratio is further supported in Exhibit MJM-5 of Mr. Morley's testimony as well as the Company's response to TRA FG Item No. 81, where the actual capital structures of AGL for the periods ended December 31, 2005 and March 31, 2006, as well as the estimated capital structure for the period ending December 31, 2007, are provided. The common equity component of these capital structures ranges from 46.55% to 47.16%. All three common equity ratios are consistent, and in fact slightly higher, than the resulting capital structure using my proposed 50/50 capital structure ratio.

Q. Do you agree with the methodology employed in computing the actual and estimated capital structures of AGL in TRA FG Item No. 81?

A. Yes. I agree with the methodology used in computing the capital structures. The short-term debt component of a capital structure should be based on an average balance, not a year-end balance. The capital structures computed in TRA FG Item No. 81 are accurate and provide a fair and reasonable basis for determining CGC's rate of return for ratemaking purposes.

Q. If capital market conditions change significantly between the date of filing your prepared testimony and the date oral testimony is presented, would this cause you to revise your estimated cost of equity?

A. Yes. Interest rates and security prices do change over time, and risk premiums change also, although much more sluggishly. If substantial changes were to occur between the filing date and the time my oral testimony is presented, I will update my testimony accordingly.

Q. Does this conclude your testimony?

A. Yes, it does.

APPENDIX A
CAPM, EMPIRICAL CAPM

The Capital Asset Pricing Model (CAPM) is a fundamental paradigm of finance. Simply put, the fundamental idea underlying the CAPM is that risk-averse investors demand higher returns for assuming additional risk, and higher-risk securities are priced to yield higher expected returns than lower-risk securities. The CAPM quantifies the additional return, or risk premium, required for bearing incremental risk. It provides a formal risk-return relationship anchored on the basic idea that only market risk matters, as measured by beta. According to the CAPM, securities are priced such that their:

EXPECTED RETURN = RISK-FREE RATE + RISK PREMIUM

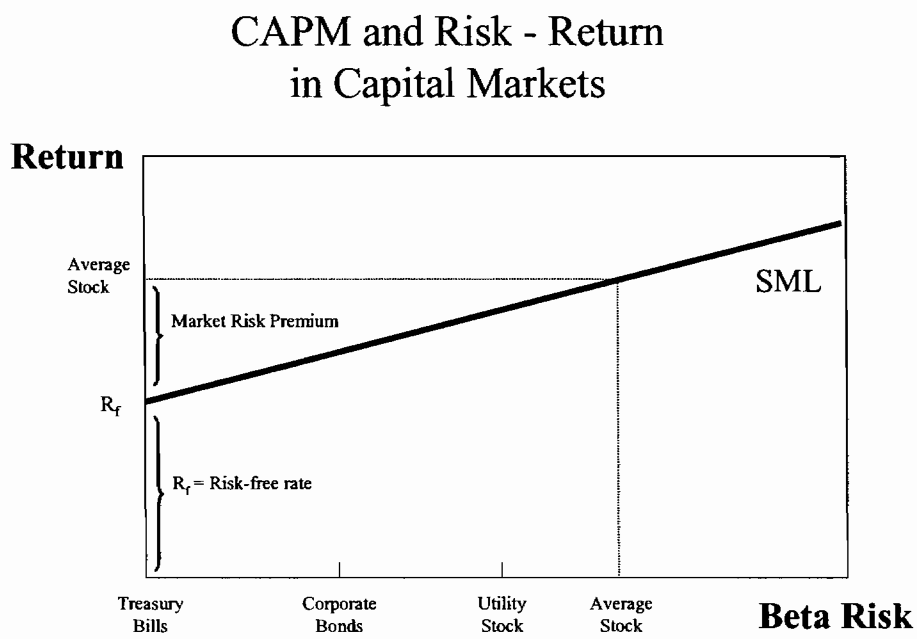
Denoting the risk-free rate by R_F and the return on the market as a whole by R_M, the CAPM is:

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

Equation 1 is the CAPM expression which asserts that an investor expects to earn a return, K, that could be gained on a risk-free investment, R_F, plus a risk premium for assuming risk, proportional to the security's market risk, also known as beta, β, and the market risk premium, $(R_M - R_F)$, where R_M is the market return . The market risk premium $(R_M - R_F)$ can be abbreviated MRP so that the CAPM becomes:

$$K = R_F + \beta \times MRP \qquad (2)$$

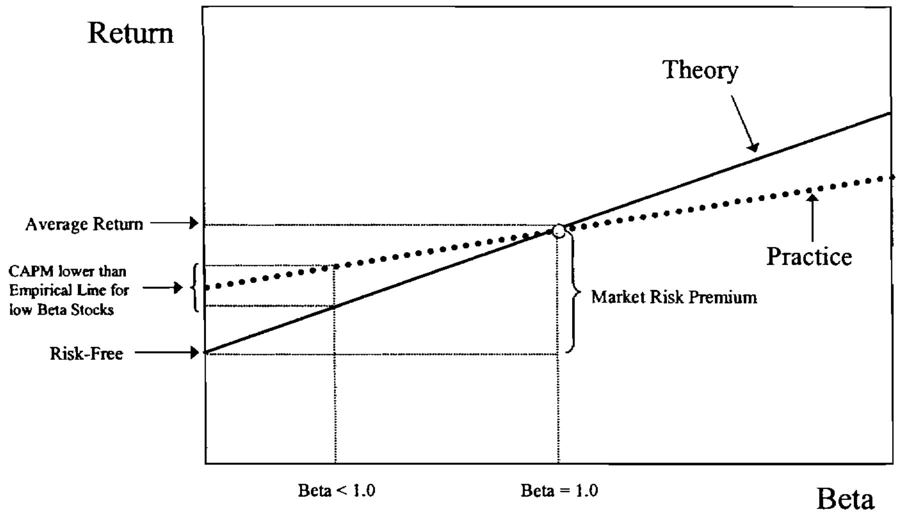
The CAPM risk-return relationship is depicted in the figure below and is typically labeled as the Security Market Line (SML) by the investment community.



A myriad empirical tests of the CAPM have shown that the risk-return tradeoff is not as steeply sloped as that predicted by the CAPM, however. That is, low-beta securities earn returns somewhat higher than the CAPM would predict, and high-beta securities earn less than predicted. In other words, the CAPM tends to overstate the actual sensitivity of the cost of capital to beta: low-beta stocks tend to have higher returns and high-beta stocks tend to have lower risk returns than predicted by the CAPM. The difference between the CAPM and the type of relationship observed in the empirical studies is depicted in the figure below. This is one of the most widely known empirical findings of the finance literature. This extensive literature is summarized in Chapter 13 of Dr. Morin's book [Regulatory Finance, Public Utilities Report Inc., Arlington, VA, 1994].

Risk vs Return

Theory vs. Practice



A number of refinements and expanded versions of the original CAPM theory have been proposed to explain the empirical findings. These revised CAPMs typically produce a risk-return relationship that is flatter than the standard CAPM prediction. The following equation makes use of these empirical findings by flattening the slope of the risk-return relationship and increasing the intercept:

$$K = R_F + \alpha + \beta\ (MRP - \alpha) \qquad (3)$$

where α is the "alpha" of the risk-return line, a constant determined empirically, and the other symbols are defined as before. Alternatively, Equation 3 can be written as follows:

$$K = R_F + a\,MRP + (1\text{-}a)\,\beta\,MRP \qquad (4)$$

where a is a fraction to be determined empirically. Comparing Equations 3 and 4, it is easy to see that alpha equals 'a' times MRP, that is, $\alpha = a \times MRP$

Theoretical Underpinnings

The obvious question becomes what would produce a risk return relationship which is flatter than the CAPM prediction, or in other words, how do you explain the presence of "alpha" in the above equation. The exclusion of variables aside from beta would produce this result. Three such variables are noteworthy: dividend yield, skewness, and hedging potential.

The dividend yield effects stem from the differential taxation on corporate dividends and capital gains. The standard CAPM does not consider the regularity of dividends received by investors. Utilities generally maintain high dividend payout ratios relative to the market, and by ignoring dividend yield, the CAPM provides biased cost of capital estimates. To the extent that dividend income is taxed at a higher rate than capital gains, investors will require higher pre-tax returns in order to equalize the after-tax returns provided by high-yielding stocks (e.g. utility stocks) with those of low-yielding stocks. In other words, high-yielding stocks must offer investors higher pre-tax returns. Even if dividends and capital gains are undifferentiated for tax purposes, there is still a tax bias in favor of earnings retention (lower dividend payout), as capital gains taxes are paid only when gains are realized.

Empirical studies by Litzenberger and Ramaswamy (1979), Litzenberger et al. (1980) and Rosenberg and Marathe (1975) find that security returns are positively related to dividend yield as well as to beta. These results are consistent with after-tax extensions of the CAPM developed by Breenan (1973) and Litzenberger and Ramaswamy (1979) and suggest that the relationship between return, beta, and dividend yield should be estimated and employed to calculate the cost of equity capital.

As far as skewness is concerned, investors are more concerned with losing money than with total variability of return. If risk is defined as the probability of loss, it appears more logical to measure risk as the probability of achieving a return which is below the expected return. The traditional CAPM provides downward-biased estimates of cost of capital to the extent that these skewness effects are significant. As shown by Kraus and Litzenberger (1976), expected return depends on both on a stock's systematic risk (beta) and the systematic skewness. Empirical studies by Kraus and Litzenberger (1976), Friend, Westerfield, and Granito (1978), and Morin (1981) found that, in addition to beta, skewness of returns has a significant negative relationship with security returns. This result is consistent with the skewness version of the CAPM developed by Rubinstein (1973) and Kraus and Litzenberger (1976).

This is particularly relevant for public utilities whose future profitability is constrained by the regulatory process on the upside and relatively unconstrained on the downside in the face of socio-political realities of public utility regulation. The process of regulation, by restricting the upward potential for returns and responding sluggishly on the downward side, may impart some asymmetry to the distribution of returns, and is more likely to result in utilities earning less, rather than more, than their cost of capital. The traditional CAPM provides downward-biased estimates of cost of capital to the extent that these skewness effects are significant.

As far as hedging potential is concerned, investors are exposed to another kind of risk, namely, the risk of unfavorable shifts in the investment opportunity set. Merton (1973) shows that investors will hold portfolios consisting of three funds: the risk-free asset, the market portfolio, and a portfolio whose returns are perfectly negatively correlated with the riskless asset so as to hedge against unforeseen changes in the future risk-free rate. The higher the degree of protection offered by an asset against unforeseen changes in interest rates, the lower the required return, and conversely. Merton argues that low beta assets, like utility stocks, offer little protection against changes in interest rates, and require higher returns than suggested by the standard CAPM.

Another explanation for the CAPM's inability to fully explain the process determining security returns involves the use of an inadequate or incomplete market index. Empirical studies to validate the CAPM invariably rely on some stock market index as a proxy for the true market portfolio. The exclusion of several asset categories from the definition of market index mis-specifies the CAPM and biases the results found using only stock market data. Kolbe and Read (1983) illustrate the biases in beta estimates which result from applying the CAPM to public utilities. Unfortunately, no comprehensive and easily accessible data exist for several classes of assets, such as mortgages and business investments, so that the exact relation between return and stock betas predicted by the CAPM does not exist. This suggests that the empirical relationship between returns and stock betas is best estimated empirically (ECAPM) rather than by relying on theoretical and elegant CAPM models expanded to include missing assets effects. In any event, stock betas may be highly correlated with the true beta measured with the true market index.

Yet another explanation for the CAPM's inability to fully explain the observed risk-return tradeoff involves the possibility of constraints on investor borrowing that run counter to the assumptions of the CAPM. In response to this inadequacy, several versions of the CAPM have been developed by researchers. One of these versions is the so-called zero-beta, or two-factor, CAPM which provides for a risk-free return in a market where borrowing and lending rates are divergent. If borrowing rates and lending rates differ, or there is no risk-free borrowing or lending, or there is risk-free lending but no risk-free borrowing, then the CAPM has the following form:

$$K = R_Z + \beta(R_m - R_F)$$

The model, christened the zero-beta model, is analogous to the standard CAPM, but with the return on a minimum risk portfolio which is unrelated to market returns, R_Z, replacing the risk-free rate, R_F. The model has been empirically tested by Black, Jensen, and Scholes (1972), who found a flatter than predicted CAPM, consistent with the model and other researchers' findings.

The zero-beta CAPM cannot be literally employed in cost of capital projections, since the zero-beta portfolio is a statistical construct difficult to replicate.

Empirical Evidence

A summary of the empirical evidence on the magnitude of alpha is provided in the table below.

Empirical Evidence on the Alpha Factor		
Author	**Range of alpha**	**Period relied upon**
Fischer (1993)	-3.6% to 3.6%	1931-1991
Fischer, Jensen and Scholes (1972)	-9.61% to 12.24%	1931-1965
Fama and McBeth (1972)	4.08% to 9.36%	1935-1968
Fama and French (1992)	10.08% to 13.56%	1941-1990
Litzenberger and Ramaswamy (1979)	5.32% to 8.17%	
Litzenberger, Ramaswamy and Sosin (1980)	1.63% to 5.04%	1926-1978
Pettengill, Sundaram and Mathur (1995)	4.6%	
Morin (1994)	2.0%	1926-1984
Harris, Marston, Mishra, and O'Brien	2.0%	1983-1998

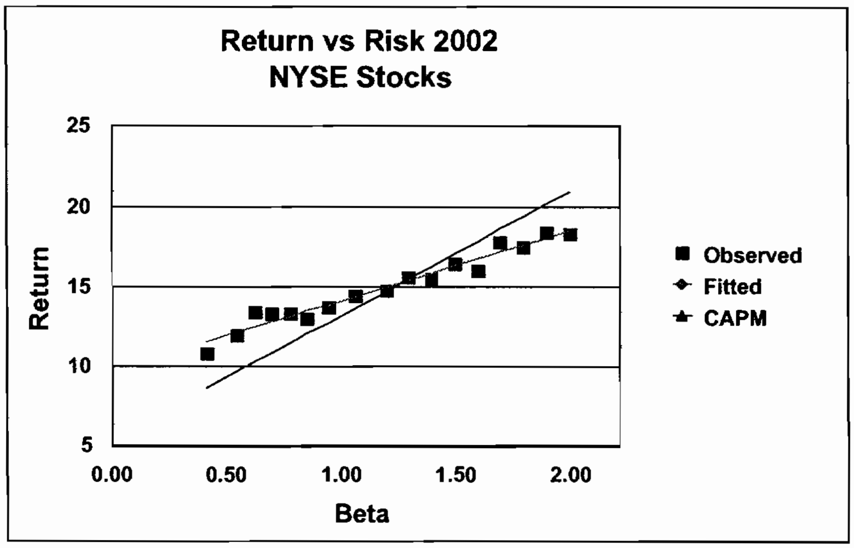
Given the observed magnitude of alpha, the empirical evidence indicates that the risk-return relationship is flatter than that predicted by the CAPM. Typical of the empirical evidence is the findings cited in Morin (1994) over the period 1926-1984 indicating that the observed expected return on a security is related to its risk by the following equation:

$$K = .0829 + .0520\,\beta$$

Given that the risk-free rate over the estimation period was approximately 6%, this relationship implies that the intercept of the risk-return relationship is higher than the 6% risk-free rate, contrary to the CAPM's prediction. Given that the average return on an average risk stock exceeded the risk-free rate by about 8.0% in that period, that is, the market risk premium (R_M - R_F) = 8%, the intercept of the observed relationship between return and beta exceeds the risk-free rate by about 2%, suggesting an alpha factor of 2%.

Most of the empirical studies cited in the above table utilize raw betas rather than Value Line adjusted betas because the latter were not available over most of the time periods covered in these studies. A study of the relationship between return and adjusted beta is reported on Table 6-7 in Ibbotson Associates Valuation Yearbook 2001. If we exclude the portfolio of very small cap stocks from the relationship due to significant size effects, the relationship between the arithmetic mean return and beta for the remaining portfolios is flatter than predicted and the intercept slightly higher than predicted by the CAPM, as shown on the graph below. It is noteworthy that the Ibbotson study relies on adjusted betas as stated on page 95 of the aforementioned study.

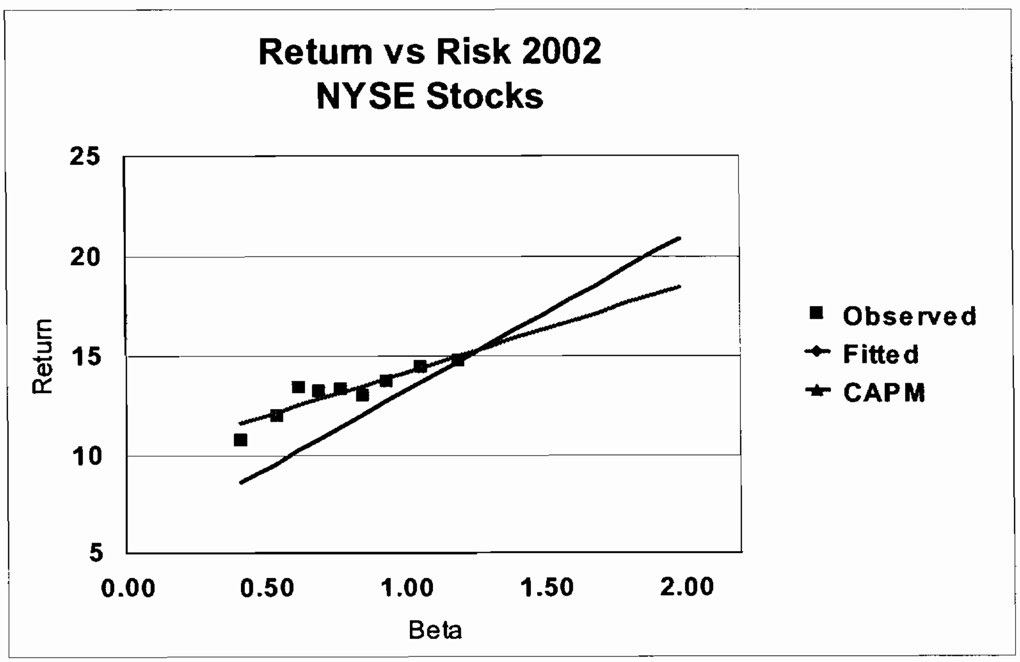
CAPM vs ECAPM



Another study by Morin in May 2002 provides empirical support for the ECAPM. All the stocks covered in the Value Line Investment Survey for Windows for which betas and returns data were available were retained for analysis. There were nearly 2000 such stocks. The expected return was measured as the total shareholder return ("TSR") reported by Value Line over the past ten years. The Value Line adjusted beta was also retrieved from the same data base. The nearly 2000 companies for which all data were available were ranked in ascending order of beta, from lowest to highest. In order to palliate measurement error, the nearly 2000 securities were grouped into ten portfolios of approximately 180 securities for each portfolio. The average returns and betas for each portfolio were as follows:

Portfolio #	Beta	Return
portfolio 1	0.41	10.87
portfolio 2	0.54	12.02
portfolio 3	0.62	13.50
portfolio 4	0.69	13.30
portfolio 5	0.77	13.39
portfolio 6	0.85	13.07
portfolio 7	0.94	13.75
portfolio 8	1.06	14.53
portfolio 9	1.19	14.78
portfolio 10	1.48	20.78

It is clear from the graph below that the observed relationship between DCF returns and Value Line adjusted betas is flatter than that predicted by the plain vanilla CAPM. The observed intercept is higher than the prevailing risk-free rate of 5.7% while the slope is less than equal to the market risk premium of 7.7% predicted by the plain vanilla CAPM for that period.



In an article published in Financial Management, Harris, Marston, Mishra, and O'Brien ("HMMO") estimate ex ante expected returns for S&P 500 companies over the period 1983-1998[1]. HMMO measure the expected rate of return (cost of equity) of each dividend-paying stock in the S&P 500 for each month from January 1983 to August 1998 by using the constant growth DCF model. They then investigate the relation between the risk premium (expected return over the 20-year Treasury bond yield) estimates for each month to equity betas as of that same month (5-year raw betas).

The table below, drawn from HMMO Table 4, displays the average estimate prospective risk premium (Column 2) by industry and the corresponding beta estimate for that industry, both in raw form (Column 3) and adjusted form (Column 4). The latter were calculated with the traditional Value Line – Merrill Lynch – Bloomberg adjustment methodology by giving 1/3 weight of to a beta estimate of 1.00 and 2/3 weight to the raw beta estimate.

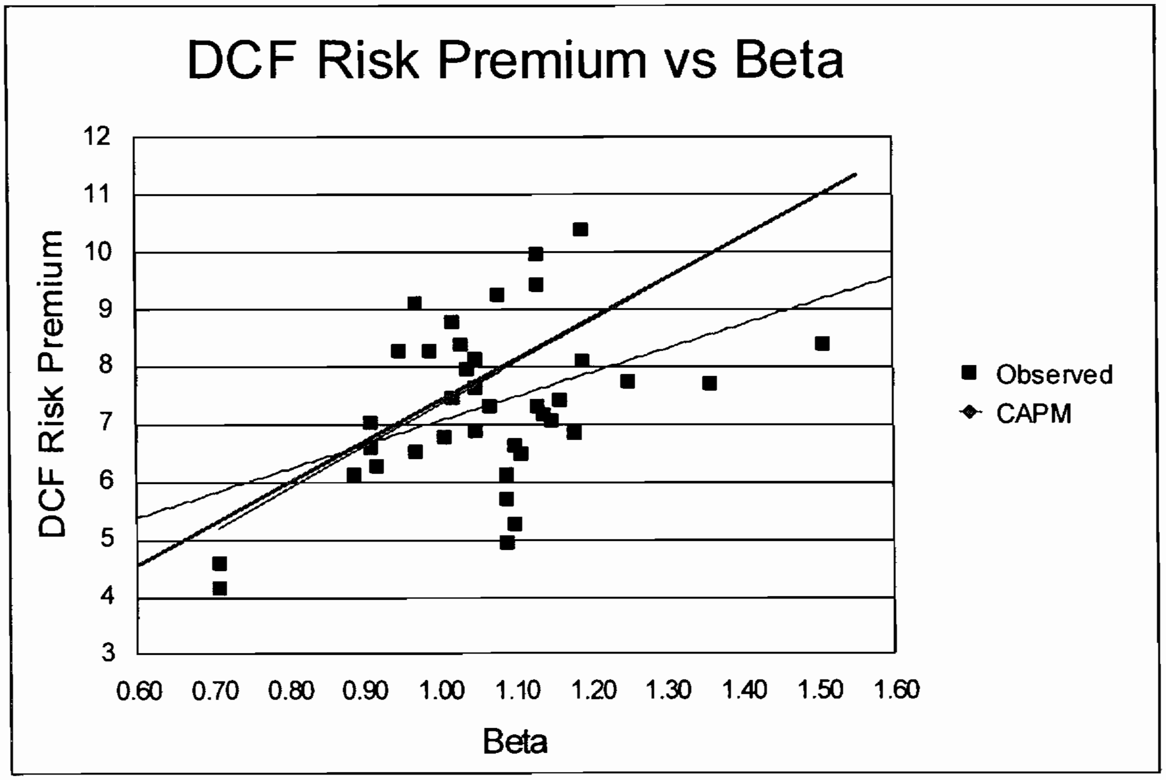
[1] Harris, R. S., Marston, F. C., Mishra, D. R., and O'Brien, T. J., "*Ex Ante* Cost of Equity Estimates of S&P 500 Firms: The Choice Between Global and Domestic CAPM," Financial

Table A-1 Risk Premium and Beta Estimates by Industry

	Industry (1)	DCF Risk Premium (2)	Raw Industry Beta (3)	Adjusted Industry Beta (4)
1	Aero	6.63	1.15	1.10
2	Autos	5.29	1.15	1.10
3	Banks	7.16	1.21	1.14
4	Beer	6.60	0.87	0.91
5	BldMat	6.84	1.27	1.18
6	Books	7.64	1.07	1.05
7	Boxes	8.39	1.04	1.03
8	BusSv	8.15	1.07	1.05
9	Chems	6.49	1.16	1.11
10	Chips	8.11	1.28	1.19
11	Clths	7.74	1.37	1.25
12	Cnstr	7.70	1.54	1.36
13	Comps	9.42	1.19	1.13
14	Drugs	8.29	0.99	0.99
15	ElcEq	6.89	1.08	1.05
16	Energy	6.29	0.88	0.92
17	Fin	8.38	1.76	1.51
18	Food	7.02	0.86	0.91
19	Fun	9.98	1.19	1.13
20	Gold	4.59	0.57	0.71
21	Hlth	10.40	1.29	1.19
22	Hsld	6.77	1.02	1.01
23	Insur	7.46	1.03	1.02
24	LabEq	7.31	1.10	1.07
25	Mach	7.32	1.20	1.13
26	Meals	7.98	1.06	1.04
27	MedEq	8.80	1.03	1.02
28	Pap	6.14	1.13	1.09
29	PerSv	9.12	0.95	0.97
30	Retail	9.27	1.12	1.08
31	Rubber	7.06	1.22	1.15
32	Ships	1.95	0.95	0.97
33	Stee	4.96	1.13	1.09
34	Telc	6.12	0.83	0.89
35	Toys	7.42	1.24	1.16
36	Trans	5.70	1.14	1.09
37	Txtls	6.52	0.95	0.97
38	Util	4.15	0.57	0.71
39	Whlsl	8.29	0.92	0.95
	MEAN	**7.19**		

The observed statistical relationship between expected return and **adjusted beta** is shown in the graph below along with the CAPM prediction:

Management, Autumn 2003, pp. 51-66.



If the plain vanilla version of the CAPM is correct, then the intercept of the graph should be zero, recalling that the vertical axis represents returns in excess of the risk-free rate. Instead, the observed intercept is approximately 2%, that is approximately equal to 25% of the expected market risk premium of 7.2% shown at the bottom of Column 2 over the 1983-1998 period, as predicted by the ECAPM. The same is true for the slope of the graph. If the plain vanilla version of the CAPM is correct, then the slope of the relationship should equal the market risk premium of 7.2%. Instead, the observed slope of close to 5% is approximately equal to 75% of the expected market risk premium of 7.2%, as predicted by the ECAPM.

In short, the HMMO empirical findings are quite consistent with the predictions of the ECAPM.

Practical Implementation of the ECAPM

The empirical evidence reviewed above suggests that the expected return on a security is related to its risk by the following relationship:

$$K = R_F + \alpha + \beta\ (MRP - \alpha) \tag{5}$$

or, alternatively by the following equivalent relationship:

$$K = R_F + a\,MRP + (1\text{-}a)\,\beta\,MRP \tag{6}$$

The empirical findings support values of α from approximately 2% to 7%. If one is using the short-term U.S. Treasury Bills yield as a proxy for the risk-free rate, and given that utility stocks have lower than average betas, an alpha in the lower range of the empirical findings, 2% - 3% is reasonable, albeit conservative.

Using the long-term U.S. Treasury yield as a proxy for the risk-free rate, a lower alpha adjustment is indicated. This is because the use of the long-term U.S. Treasury yield as a proxy for the risk-free rate partially incorporates the desired effect of using the ECAPM[2]. An alpha in the range of 1% - 2% is therefore reasonable.

To illustrate, consider a utility with a beta of 0.80. The risk-free rate is 5%, the MRP is 7%, and the alpha factor is 2%. The cost of capital is determined as follows:

$$K = R_F + \alpha + \beta\ (MRP - \alpha)$$

$$K = 5\% + 2\% + 0.80(7\% - 2\%)$$

$$= 11\%$$

A practical alternative is to rely on the second variation of the ECAPM:

$$K = R_F + a\,MRP + (1\text{-}a)\,\beta\,MRP$$

---

[2] The Security Market Line (SML) using the long-term risk-free rate has a higher intercept and a flatter slope than the SML using the short-term risk-free rate

With an alpha of 2%, a MRP in the 6% - 8% range, the ‘a” coefficient is 0.25, and the ECAPM becomes[3]:

$$K = R_F + 0.25 \text{ MRP} + 0.75 \beta \text{ MRP}$$

Returning to the numerical example, the utility’s cost of capital is:

$$K = 5\% + 0.25 \times 7\% + 0.75 \times 0.80 \times 7\%$$
$$= 11\%$$

For reasonable values of beta and the MRP, both renditions of the ECAPM produce results that are virtually identical[4].

---

[3] Recall that alpha equals ‘a’ times MRP, that is, alpha = a MRP, and therefore a = alpha/MRP. If alpha is 2%, then a = 0.25

[4] In the Morin (1994) study, the value of “a” was actually derived by systematically varying the constant "a" in equation 6 from 0 to 1 in steps of 0.05 and choosing that value of 'a' that minimized the mean square error between the observed relationship between return and beta:

$$K = 0.0829 + .0520 \beta$$

The value of a that best explained the observed relationship was 0.25.

REFERENCES

Black, Fischer, "Beta and Return," The Journal of Portfolio Management, Fall 1993, 8-18.

Black, Fischer, Michael C. Jensen and Myron Scholes, "The Capital Asset Pricing Model: Some Empirical Tests, from Studies in the theory of Capital Markets," in

Jensen, M. (ed.) Studies in the Theory of Capital Markets, Praeger, New York, 1972,79-121.

Breenan, M. (1973) "Taxes, Market Valuation, and Corporate Financial Policy," National Tax Journal, 23, 417-427.

Fama, Eugene F. and James D. MacBeth, "Risk, Returns and Equilibrium: Empirical Tests," Journal of Political Economy, September 1972, pp. 607-636.

Fama, Eugene F. and Kenneth R. French, "The Cross-Section of Expected Stock Returns," Journal of Finance, Vol. 47, June 1992, pp. 427-465.

Friend, I., Westerfield, R., and Granito, M. (1978) "New Evidence on the Capital Asset Pricing Model, Journal of Finance, 23, 903-916.

Harris, R. S., Marston, F. C., Mishra, D. R., and O'Brien, T. J., "Ex Ante Cost of Equity Estimates of S&P 500 Firms: The Choice Between Global and Domestic CAPM," Financial Management, Autumn 2003, pp. 51-66.

Kraus, A. and Litzenberger, R.H. (1976) "Skewness Preference and the Valuation of Risk Assets, Journal of Finance, 31, 1085-99.

Litzenberger, R. H. and Ramaswamy, K. "The Effect of Personal Taxes and Dividends on Capital Asset Prices: Theory and Empirical Evidence." Journal of Financial Economics, June 1979, 163-196.

Litzenberger, R. H., Ramaswamy, K. and Sosin, H. (1980) "On the CAPM Approach to the Estimation of a Public Utility's Cost of Equity Capital, Journal of Finance, 35, May 1980, 369-83.

Merton, R.C. (1973) "An Intertemporal Capital Asset Pricing Model", Econometrica, 41, 867-887.

Morin, R.A. (1981) "Intertemporal Market-Line Theory: An Empirical Test," Financial Review, Proceedings of the Eastern Finance Association, 1981.

Pettengill, Glenn N., Sridhar Sundaram and Ike Mathur, "The Conditional Relation between Beta and Returns," Journal of Financial and Quantitative Analysis, Vol. 30,No. 1, March 1995, pp. 101-116.

Rosenberg, V. and Marathe, V. (1975) "The Prediction of Investment Risk: Systematic and Residual Risk," Proceedings of the Seminar on the Analysis of Security Prices, Univ. of Chicago, 20, Nov. 1975.

Rubinstein, M.E. (1973) "A Mean-Variance Synthesis of Corporate Financial Theory, Journal of Financial Economics, March 1973, 167-82.

APPENDIX B

FLOTATION COST ALLOWANCE

To obtain the final cost of equity financing from the investors' expected rate of return, it is necessary to make allowance for underpricing, which is the sum of market pressure, costs of flotation, and underwriting fees associated with new issues. Allowance for market pressure should be made because large blocks of new stock may cause significant pressure on market prices even in stable markets. Allowance must also be made for company costs of flotation (including such items as printing, legal and accounting expenses) and for underwriting fees.

1. MAGNITUDE OF FLOTATION COSTS

According to empirical studies, underwriting costs and expenses average at least 4% of gross proceeds for utility stock offerings in the U.S. (See Logue & Jarrow: "Negotiations vs. Competitive Bidding in the Sale of Securities by Public Utilities", Financial Management, Fall 1978.) A study of 641 common stock issues by 95 electric utilities identified a flotation cost allowance of 5.0%. (See Borum & Malley: "Total Flotation Cost for Electric Company Equity Issues", Public Utilities Fortnightly, Feb. 20, 1986.)

Empirical studies suggest an allowance of 1% for market pressure in U.S. studies. Logue and Jarrow found that the absolute magnitude of the relative price decline due to market pressure was less than 1.5%. Bowyer and Yawitz examined 278 public utility stock issues and found an average market pressure of 0.72%. (See Bowyer & Yawitz, "The Effect of New Equity Issues on Utility Stock Prices", Public Utilities Fortnightly, May 22, 1980.)

Eckbo & Masulis ("Rights vs. Underwritten Stock Offerings: An Empirical Analysis", University of British Columbia, Working Paper No. 1208, Sept., 1987) found an average flotation cost of 4.175% for utility common stock offerings. Moreover, flotation costs increased progressively for smaller size issues. They also found that the relative price decline due to market pressure in the days surrounding the announcement amounted to slightly more than 1.5%. In a classic and monumental study published in the prestigious Journal of Financial Economics by a prominent scholar, a market pressure effect of 3.14% for industrial stock issues and 0.75% for utility common stock issues was found (see Smith, C.W., "Investment Banking and the Capital Acquisition Process," Journal of Financial Economics 15, 1986). Other studies of market pressure are reported in Logue ("On the Pricing of Unseasoned Equity Offerings, Journal of Financial and Quantitative Analysis, Jan. 1973), Pettway ("The Effects of New Equity Sales Upon Utility Share Prices," Public Utilities Fortnightly, May 10 1984), and Reilly and Hatfield ("Investor Experience with New Stock Issues," Financial Analysts' Journal, Sept.-Oct. 1969). In the Pettway study, the market pressure effect for a sample of 368 public utility equity sales was in the range of 2% to 3%. Adding the direct and indirect effects of utility common stock issues, the indicated total flotation cost allowance is above 5.0%, corroborating the results of earlier studies.

As shown in the table below, a comprehensive empirical study by Lee, Lochhead, Ritter, and Zhao, "The Costs of Raising Capital," Journal of Financial Research, Vol. XIX, NO. 1, Spring 1996, shows average direct flotation costs for equity offerings of 3.5% - 5% for stock issues between $60 and $500 million. Allowing for market pressure costs raises the flotation cost allowance to well above 5%.

FLOTATION COSTS: RAISING EXTERNAL CAPITAL
(Percent of Total Capital Raised)

Amount Raised in $ Millions	Average Flotation Cost: Common Stock	Average Flotation Cost: New Debt
$ 2 - 9.99	13.28%	4.39%
10 - 19.99	8.72	2.76
20 - 39.99	6.93	2.42
40 - 59.99	5.87	1.32
60 - 79.99	5.18	2.34
80 - 99.99	4.73	2.16
100 - 199.99	4.22	2.31
200 - 499.99	3.47	2.19
500 and Up	3.15	1.64

Note: Flotation costs for IPOs are about 17 percent of the value of common stock issued if the amount raised is less than $10 million and about 6 percent if more than $500 million is raised. Flotation costs are somewhat lower for utilities than others.

Source: Lee, Inmoo, Scott Lochhead, Jay Ritter, and Quanshui Zhao, "The Costs of Raising Capital," *The Journal of Financial Research,* Spring 1996.

Therefore, based on empirical studies, total flotation costs including market pressure amount to approximately 5% of gross proceeds. I have therefore assumed a 5% gross total flotation cost allowance in my cost of capital analyses.

2. APPLICATION OF THE FLOTATION COST ADJUSTMENT

The section below shows: 1) why it is necessary to apply an allowance of 5% to the dividend yield component of equity cost by dividing that yield by 0.95 (100% - 5%) to obtain the fair return on equity capital, and 2) why the flotation adjustment is permanently required to avoid confiscation even if no further stock issues are contemplated. Flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years.

Flotation costs are just as real as costs incurred to build utility plant. Fair regulatory treatment absolutely must permit the recovery of these costs. An analogy with bond issues is useful to understand the treatment of flotation costs in the case of common stocks.

In the case of a bond issue, flotation costs are not expensed but are rather amortized over the life of the bond, and the annual amortization charge is embedded in the cost of service. This is analogous to the process of depreciation, which allows the recovery of funds invested in utility plant. The recovery of bond flotation expense continues year after year, irrespective of whether the company issues new debt capital in the future, until recovery is complete. In the case of common stock that has no finite life, flotation costs are not amortized. Therefore, the recovery of flotation cost requires an upward adjustment to the allowed return on equity. Roger A. Morin, Regulatory Finance, Public Utilities Reports Inc., Arlington, Va., 1994, provides numerical illustrations that show that even if a utility does not contemplate any additional common stock issues, a flotation cost adjustment is still permanently required. Examples there also demonstrate that the allowance applies to retained earnings as well as to the original capital.

From the standard DCF model, the investor's required return on equity capital is expressed as:

$$K = D_1/P_o + g$$

If P_o is regarded as the proceeds per share actually received by the company from which dividends and earnings will be generated, that is, P_o equals B_o, the book value per share, then the company's required return is:

$$r = D_1/B_o + g$$

Denoting the percentage flotation costs 'f', proceeds per share B_o are related to market price P_o as follows:

$$P - fP = B_o$$

$$P(1 - f) = B_o$$

Substituting the latter equation into the above expression for return on equity, we obtain:

$$r = D_1/P(1-f) + g$$

that is, the utility's required return adjusted for underpricing. For flotation costs of 5%, dividing the expected dividend yield by 0.95 will produce the adjusted cost of equity capital. For a dividend yield of 6% for example, the magnitude of the adjustment is 32 basis points: .06/.95 = .0632.

In deriving DCF estimates of fair return on equity, it is therefore necessary to apply a conservative after-tax allowance of 5% to the dividend yield component of equity cost.

Even if no further stock issues are contemplated, the flotation adjustment is still permanently required to keep shareholders whole. Flotation costs are only recovered if the rate of return is applied to total equity, including retained earnings, in all future years, even if no future financing is contemplated. This is demonstrated by the numerical example contained in pages 7-9 of this Appendix. Moreover, even if the stock price, hence the DCF estimate of equity return, fully reflected the lack of permanent allowance, the company always nets less than the market price. Only the net proceeds from an equity issue are used to add to the rate base on which the investor earns. A permanent allowance for flotation costs must be authorized in order to insure that in each year the investor earns the required return on the total amount of capital actually supplied.

The example shown on pages 7-9 shows the flotation cost adjustment process using illustrative, yet realistic, market data. The assumptions used in the computation are shown on page 7. The stock is selling in the market for $25, investors expect the firm to pay a dividend of $2.25 that will grow at a rate of 5% thereafter. The traditional DCF cost of equity is thus $k = D/P + g = 2.25/25 + .05 = 14\%$. The firm sells one share stock, incurring a flotation cost of 5%. The traditional DCF cost of equity adjusted for flotation cost is thus $ROE = D/P(1-f) + g = .09/.95 + .05 = 14.47\%$.

The initial book value (rate base) is the net proceeds from the stock issue, which are $23.75, that is, the market price less the 5% flotation costs. The example demonstrates that only if the company is allowed to earn 14.47% on rate base will investors earn their cost of equity of 14%. On page 8, Column 1 shows the initial common stock account, Column 2 the cumulative retained earnings balance, starting at zero, and steadily increasing from the retention of earnings. Total equity in Column 3 is the sum of common stock capital and retained earnings. The stock price in Column 4 is obtained from the seminal DCF formula: $D_1/(k - g)$. Earnings per share in Column 6 are simply the allowed return of 14.47% times the total common equity base. Dividends start at $2.25 and grow at 5% thereafter, which they must do if investors are to earn a 14% return. The dividend payout ratio remains constant, as per the assumption of the DCF model. All quantities, stock price, book value, earnings, and dividends grow at a 5% rate, as shown at the bottom of the relevant columns. Only if the company is allowed to earn 14.47% on equity do investors earn 14%. For example, if the company is allowed only 14%, the stock price drops from $26.25 to $26.13 in the second year, inflicting a loss on shareholders. This is shown on page 9. The growth rate drops from 5% to 4.53%. Thus, investors only earn 9% + 4.53% = 13.53% on their investment. It is noteworthy that the adjustment is always required each and every year, whether or not new stock issues are sold in the future, and that the allowed return on equity must be earned on total equity, including retained earnings, for investors to earn the cost of equity.

ASSUMPTIONS:

ISSUE PRICE =	$25.00
FLOTATION COST =	5.00%
DIVIDEND YIELD =	9.00%
GROWTH =	5.00%
EQUITY RETURN =	**14.00%**
(D/P + g)	
ALLOWED RETURN ON EQUITY =	**14.47%**
(D/P(1-f) + g)	

Yr	COMMON STOCK (1)	RETAINED EARNINGS (2)	TOTAL EQUITY (3)	STOCK PRICE (4)	MARKET / BOOK RATIO (5)	EPS (6)	DPS (7)	PAYOUT (8)
1	$23.75	$0.000	$23.750	$25.000	1.0526	$3.438	$2.250	65.45%
2	$23.75	$1.188	$24.938	$26.250	1.0526	$3.609	$2.363	65.45%
3	$23.75	$2.434	$26.184	$27.563	1.0526	$3.790	$2.481	65.45%
4	$23.75	$3.744	$27.494	$28.941	1.0526	$3.979	$2.605	65.45%
5	$23.75	$5.118	$28.868	$30.388	1.0526	$4.178	$2.735	65.45%
6	$23.75	$6.562	$30.312	$31.907	1.0526	$4.387	$2.872	65.45%
7	$23.75	$8.077	$31.827	$33.502	1.0526	$4.607	$3.015	65.45%
8	$23.75	$9.669	$33.419	$35.178	1.0526	$4.837	$3.166	65.45%
9	$23.75	$11.340	$35.090	$36.936	1.0526	$5.079	$3.324	65.45%
10	$23.75	$13.094	$36.844	$38.783	1.0526	$5.333	$3.490	65.45%
			5.00%	**5.00%**		**5.00%**	**5.00%**	

Yr	COMMON STOCK (1)	RETAINED EARNINGS (2)	TOTAL EQUITY (3)	STOCK PRICE (4)	MARKET/ BOOK RATIO (5)	EPS (6)	DPS (7)	PAYOUT (8)
------	--------	--------	--------	--------	--------	--------	--------	--------
1	$23.75	$0.000	$23.750	$25.000	1.0526	$3.325	$2.250	67.67%
2	$23.75	$1.075	$24.825	$26.132	1.0526	$3.476	$2.352	67.67%
3	$23.75	$2.199	$25.949	$27.314	1.0526	$3.633	$2.458	67.67%
4	$23.75	$3.373	$27.123	$28.551	1.0526	$3.797	$2.570	67.67%
5	$23.75	$4.601	$28.351	$29.843	1.0526	$3.969	$2.686	67.67%
6	$23.75	$5.884	$29.634	$31.194	1.0526	$4.149	$2.807	67.67%
7	$23.75	$7.225	$30.975	$32.606	1.0526	$4.337	$2.935	67.67%
8	$23.75	$8.627	$32.377	$34.082	1.0526	$4.533	$3.067	67.67%
9	$23.75	$10.093	$33.843	$35.624	1.0526	$4.738	$3.206	67.67%
10	$23.75	$11.625	$35.375	$37.237	1.0526	$4.952	$3.351	67.67%
			4.53%	4.53%		4.53%	4.53%	