ORIGINAL

RUTLEDGE, ECENIA, PURNELL & HOFFMAN

PROFESSIONAL ASSOCIATION
ATTORNEYS AND COUNSELORS AT LAW

STEPHEN A. ECENIA
JOHN R. ELLIS
KENNETH A. HOFFMAN
THOMAS W. KONRAD
MICHAEL G. MAIDA
MARTIN P. McDONNELL

POST OFFICE BOX 551, 32302-0551
215 SOUTH MONROE STREET, SUITE 420
TALLAHASSEE, FLORIDA 32301-1841

TELEPHONE (850) 681-6788
TELECOPIER (850) 681-6515

J STEPHEN MENTON
R. DAVID PRESCOTT
HAROLD F. X. PURNELL
GARY R. RUTLEDGE

GOVERNMENTAL CONSULTANTS
MARGARET A. MENDUNI
M LANE STEPHENS

September 7, 2001

RECEIVED-FPSC
01 SEP -7 PM 3:08
COMMISSION CLERK

Ms. Blanca S. Bayo, Director
Division of Records and Reporting
Florida Public Service Commission
2540 Shumard Oak Boulevard
Betty Easley Conference Center, Room 110
Tallahassee, Florida 32399-0850

HAND DELIVERY

Re: Docket No. 010006-WS

Dear Ms. Bayo:

Enclosed herewith for filing in the above-referenced docket on behalf of Florida Waterworks Association ("FWA") are the original and fifteen copies of Florida Waterworks' Direct Testimony of Dr. Roger A. Morin.

Please acknowledge receipt of these documents by stamping the extra copy of this letter "filed" and returning the copy to me.

Thank you for your assistance with this filing.

Sincerely,

J. Stephen Menton

J. Stephen Menton

JSM/knb
Enclosures
cc: Counsel of Record

APP ___
CAF ___
CMP ___
COM 5 toy
CTR ___
ECR ___
LEG 1
OPC ___
PAI ___
RGO ___
SEC 1
SER ___
OTH ___

RECEIVED & FILED
RLM
FPSC-BUREAU OF RECORDS

DOCUMENT NUMBER-DATE
11186 SEP-7 01
FPSC-COMMISSION CLERK

ORIGINAL

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

In re: Water and wastewater industry annual reestablishment of authorized range of return on on common equity for water and wastewater utilities pursuant to Section 367.081(4)(f), F.S.	)	Docket No. 010006-WS

DIRECT TESTIMONY

OF

DR. ROGER A. MORIN

ON BEHALF OF

FLORIDA WATERWORKS ASSOCIATION

DOCUMENT NUMBER-DATE
11186 SEP-7 01
FPSC-COMMISSION CLERK

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 MBA 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 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, Va. 1984. My more recent book, Regulatory Finance, is a voluminous treatise on the application of finance to regulated utilities and was released by the same publisher in late 1994. 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 No. ___ (RAM-1) describes my professional credentials in more detail.

Q. HAVE YOU TESTIFIED ON COST OF CAPITAL BEFORE?

A. Yes, I have been a cost of capital witness before more than 40 regulatory bodies in North America, including the Florida Public Service Commission ("the Commission"), the Federal Energy Regulatory Commission, and the Federal Communications Commission. I have also appeared before the following state and provincial commissions:

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

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

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to present an independent analysis of the fair and reasonable rate of return on equity upon which the Commission should base its leverage formula methodology for water and wastewater utilities in the state of Florida, with particular emphasis on the fair return on a company's common equity capital committed to that business. Based upon this appraisal, I have formed my professional judgment as to a range of returns on such capital which would (1) be fair to ratepayers, (2) allow a utility to attract capital on reasonable terms, (3) enable a utility to maintain its financial integrity; and (4) be comparable to returns offered on comparable risk investments. My testimony in these proceedings will outline what I believe to be the appropriate analytical tools for determining a fair and reasonable return on equity. I will also delineate my conclusions as to a reasonable range of returns based upon the results of these analytical models. I will also comment on the

Commission's leverage formula employed in setting the allowed rate of return ("ROE").

Q. HAVE YOU REVIEWED THE NOTICE OF PROPOSED AGENCY ACTION ORDER, ORDER NO. PSC-01-1226-PAA-WS (THE "PAA ORDER") ESTABLISHING AN AUTHORIZED RANGE OF RETURNS ON COMMON EQUITY FOR WATER AND WASTEWATER UTILITIES WHICH WAS ENTERED BY THE COMMISSION ON JUNE 1, 2001?

A. Yes. The Order proposes a continuation of the current leverage formula methodology with a range of return on equity from 9.14% at 100% equity to 10.24% at 40% equity.

Q. DO YOU BELIEVE THAT THE RANGE OF RETURN ON EQUITY SET FORTH IN THE PAA ORDER IS FAIR AND REASONABLE FOR THE WATER AND WASTEWATER INDUSTRY IN FLORIDA?

A. No. For the reasons set forth below, it is my opinion that the range of returns set forth in the PAA Order is too low.

Q. WOULD YOU PLEASE BRIEFLY IDENTIFY THE EXHIBITS AND APPENDICES ACCOMPANYING YOUR DIRECT TESTIMONY?

A. Yes. I have attached to my direct testimony Exhibits____ (RAM-1 through RAM-7) and Appendix A. These Exhibits and Appendix relate directly to points in my testimony, and are described in further detail in connection with those points.

Q. PLEASE SUMMARIZE YOUR FINDINGS.

A. It is my opinion that a just and reasonable range of return on common equity to be used as part of the leverage formula methodology for ratemaking purposes on a company's common equity capital should be 10.0% to 13.4% with a midpoint of 11.7% for a typical Florida water and wastewater utility ("FWU") with an average capital structure. Individual FWU rates of return on equity can be determined within that range in accordance with a leverage adjustment based on the common equity ratio of each company. Alternatively, until a formal comprehensive review of the leverage formula is completed, individual FWU rates of return on equity can be determined in accordance with a revised leverage formula that replicates the range of results obtained.

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 CAPM analyses, one using the plain vanilla CAPM and another using an empirical approximation of the CAPM (ECAPM). I performed four risk premium analyses: two historical risk premium analyses on comparable regulated industries, and two studies of the risk premiums allowed in those same regulated industries. I also performed DCF analyses on three surrogates for the water and wastewater industry. They are: a group of large water utilities (which are larger than the typical Florida water and wastewater utilities), a group of generation divested electric utilities, and a group of natural gas distribution utilities. My recommended range of returns reflects the application of my professional judgment to the results in light of the indicated returns from my Risk Premium, CAPM, and DCF analyses.

Q. PLEASE DESCRIBE HOW YOUR TESTIMONY IS ORGANIZED.

A. My testimony is organized in four (4) broad sections:

I. Regulatory Framework and Rate of Return

II. Cost of Equity Estimates

III. Summary of Results

IV. Leverage Formula Methodology

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 an appropriate range of returns are summarized. The fourth section discusses the use of a leverage formula methodology.

I. <u>REGULATORY FRAMEWORK AND RATE OF RETURN</u>

Q. WHAT ECONOMIC AND FINANCIAL CONCEPTS HAVE GUIDED YOUR ASSESSMENT OF THE INDUSTRY?

A. Two fundamental economic principles underlie the appraisal of the 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 alternate 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 an equality between the return on physical asset investments and the company's cost of capital.

Q. CAN YOU EXPLAIN THE CONTEXT IN WHICH RATE OF RETURN IS EVALUATED FOR A REGULATED PRIVATE ENTERPRISE SUCH AS A WATER AND WASTEWATER UTILITY?

A. Under a traditional cost-based regulatory framework, utilities are obligated to provide safe, reliable, adequate service to all customers willing and able to pay for service within their designated service area. Customers must be served without undue discrimination at fair and reasonable prices. Utilities are usually given exclusive rights to provide service within the designated service area and may establish or are subject to a regulatory body's rules and regulations covering such matters as safety, payment, and other commercial aspects of service. The utility is a private enterprise and is entitled to charge a fair and reasonable price which covers the costs it incurs to provide service subject to oversight and approval of the state regulatory entity. In Florida, that regulatory entity is the Commission. The owners of the utility are entitled to a fair rate of return on their investment used to deliver utility services.

Q. WHAT ARE THE REGULATORY PRACTICES AND PROCEDURES FOR DETERMINING FAIR AND REASONABLE PRICES UNDER THIS REGULATORY FRAMEWORK?

A. Fair and reasonable prices begin with the costs of providing utility service. Costs are limited to those reasonably and prudently incurred. In addition, a utility is entitled to include in its prices a return on the capital it has prudently invested for the provision of utility service.

Expenses of activities unrelated to the provision of utility service are excluded from the price of utility services as are returns on capital not devoted to utility service.

Q. PLEASE EXPLAIN HOW A REGULATED COMPANY'S RATES SHOULD BE SET UNDER TRADITIONAL COST OF SERVICE REGULATION.

A. Under the traditional regulatory process, a regulated company's rates should be set so that the company covers 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. One of the goals of my testimony is to estimate a fair and reasonable return on common equity capital for water and wastewater utilities.

Q. HOW IS THE AMOUNT OF CAPITAL DEVOTED TO THE PROVISION OF UTILITY SERVICE DETERMINED?

A. This amount cannot be specifically or directly identified. It is common for a utility to engage in some non-utility investing activities--if only for short-term cash management purposes. In addition, many companies operate non-utility businesses or operate in more than one regulatory jurisdiction. And, of course, many utilities have utility assets under construction or, which even if complete and ready for service are, for one reason or another, not considered to be yet devoted to utility service. While the total amount of capital is easily identified from the utility's books and records, it is not readily determinable what proportion of that capital is devoted to utility service. Consequently, among those practices and procedures which have evolved in the art of cost-based ratemaking is the method of estimating how much capital is devoted to utility service.

Q. HOW IS THE AMOUNT OF CAPITAL DEVOTED TO UTILITY SERVICE ESTIMATED?

A. Working with values and/or transactions shown on the utility's books of account, a study is made to identify the cost of assets devoted to the provision of utility service. This would include utility plant, inventories, prepayments and other assets together with an allowance for the amount of money needed to fund utility expenses prior to receipt of customers' payment for service. These amounts are reduced by accumulated depreciation, amounts advanced by vendors or customers and other cost-free capital. The amount determined through this technique has come to be known as "rate base."

"Rate base" is a surrogate for the amount of capital investors have supplied for the provision of utility service. "Rate base" represents not so many feet of pipe or number of meters, pumps or structures, but rather the number of dollars of common stock equity or long-term debt devoted to utility service. It is this amount of capital upon which investors are entitled to earn a reasonable return.

Q. HOW IS A REASONABLE RETURN DETERMINED?

A. It begins with the amounts of capital shown on the utility's books of account. For those utilities that utilize debt or preferred stock as part of their capital, the cost of these elements of capital can be calculated. The cost of common equity capital (common stock, other paid-in capital and retained earnings) is estimated using stock market data. The weighted cost of these forms of capital (together with cost-free capital, if any) is the "reasonable return" which is allowed on investors' capital ("rate base").

These methods and procedures result in prices based upon historic original costs rather than current values of the resources devoted to utility service. However calculated, courts have held that a reasonable return must be sufficient to enable the utility to maintain its credit standing and financial integrity, sufficient to enable it to attract new capital at reasonable costs and commensurate with returns being earned on investments attended by corresponding risks.

Q. ARE UTILITY INVESTORS TOTALLY PROTECTED FROM RISK WHEN RATES ARE SET AS YOU DESCRIBE?

A. Utility investments are not risk free. Utility investors carry the risk of the success or failure of the enterprise as in any other kind of business. This generally includes weather, customer usage, management's ability to control costs, competition from other providers, inflation and regulatory lag, as well as market risks. The water and wastewater industry has additional risks beyond these normal risks. The rate of return allowed on utility investors' capital is generally lower than might be earned in some other types of businesses, but should include an allowance for the risks investors do face.

Q. ARE UTILITY INVESTORS EXPOSED TO CAPITAL LOSSES ON THEIR INVESTMENTS?

A. Yes, they are. Depending on factors both related and unrelated to the specific utility, some investors have suffered substantial capital losses.

Q. DO CHANGES IN THE VALUE OF ASSETS DEVOTED TO UTILITY SERVICE AND INCLUDED IN "RATE BASE" RESULT IN AN INCREASE OR DECREASE IN THE AMOUNT OF RETURN ON CAPITAL ALLOWED BY REGULATORS?

A. No, values other than actual cost - - usually historic original cost - - are generally not considered. The Commission's interpretation of Chapter 367, Florida Statutes, is that returns allowed must be limited to the original cost of utility assets at the time of dedication to public use. This interpretation has been consistently applied for many years and was reaffirmed in its Order No. 25729 issued February 17, 1992 which states "This Commission has consistently interpreted the "investment of the utility" as contained in Section 367.081(2)(a), Florida Statutes, to be the original cost of the property when first dedicated to public service, not only in the context of acquisition adjustments, but elsewhere as well."

Thus, although the book values of utility assets may be significantly lower than replacement values of those assets, customers are totally shielded from price increases which might otherwise reflect those increased costs. For those assets which provide service to customers until retirement from service, neither depreciation nor return allowances included in utility service prices reflect the higher costs which investors will face upon replacing such assets. This risk rests squarely on investors.

Q. WHAT MUST BE CONSIDERED IN ESTIMATING A FAIR RETURN ON EQUITY?

A. As discussed in the next section, 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 the 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 alternatives of comparable risk.

Q. HOW IS A UTILITY'S FAIR RATE OF RETURN DERIVED?

A. The fair rate of return in dollars is obtained by multiplying the established rate of return set by the regulator by the "rate base". The rate base is essentially the net book value of the utility's plant considered used and useful in dispensing service. As discussed in the section IV, regulatory entities will frequently establish a methodology for determining a reasonable range of returns that varies depending upon an enterprise's debt/equity ratio.

Q. WHAT FUNDAMENTAL PRINCIPLES UNDERLIE THE DETERMINATION OF A FAIR AND REASONABLE RATE OF RETURN?

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 & Improvement Co. v. Public Service Commission of West Virginia, 262 U.S. 679 (1923).

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 return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity 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 & Water Division, 411 U.S. 458 (1973), in Permian Basin Rate Cases, 390 U.S. 747 (1968), and most recently in Duquesne Light Co. vs. 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 a utility 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 "cost of capital". The cost of capital is the opportunity cost, expressed in percentage terms, of the total pool of capital employed by the utility. It is the composite weighted cost of the various classes of capital (bonds, preferred stock, common stock) used by the utility, with the weights reflecting the proportions of the total that each class of capital represents.

While utilities 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, machines, or capital. 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 concept of opportunity costs. 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. Investors are willing to incur this double penalty only if they are adequately compensated. The compensation they require is the price of capital. 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 price differences in much the same way that differences in the characteristics of commodities are reflected in different prices.

The important point is that the prices of debt capital and equity capital are set by supply and demand, and both are 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 A UTILITY COMPANY OBTAIN ITS CAPITAL?

A. The funds employed by a utility 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 easily ascertained 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. The return on common equity estimate can then be easily combined with the embedded cost of debt and preferred stock together with the capital structure, in order to arrive at the overall cost of capital.

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 determine 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 foregone investments in other companies, and the returns available from other investments of comparable risk.

II. <u>COST OF EQUITY ESTIMATES</u>

Q. DR. MORIN, HOW DID YOU ARRIVE AT YOUR RANGE OF THE FAIR RATES OF RETURN ON COMMON EQUITY FOR FLORIDA WATER AND WASTEWATER UTILITIES?

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

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 so as 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. 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. Hence, several methodologies applied to several comparable risk companies should be employed to estimate the cost of capital.

Q. HOW DID YOU APPLY THE RISK PREMIUM METHOD TO THIS INDUSTRY?

A. In order to quantify the risk premium for the industry, I have performed six risk premium studies. The first two studies deal with aggregate stock market risk premium evidence and the other four deal directly with the utility industry.

1. CAPM ESTIMATES

Q. PLEASE DESCRIBE YOUR APPLICATION OF THE CAPM RISK PREMIUM APPROACH.

A. I developed two risk premium estimates based respectively 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 $\beta(R_M - R_F)$. 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 5.8%. For beta, I used 0.65, and for the market risk premium, I used 7.8%. These inputs to the CAPM are explained below.

Q. PLEASE EXPLAIN THE BASIS FOR THE RISK-FREE RATE THAT YOU USED IN YOUR RISK PREMIUM ANALYSES?

A. To implement the Risk Premium method, 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 actual yields on long-term Treasury bonds. Long-term rates are the relevant benchmarks when determining the cost of common equity, rather than short-term interest rates. Short-term rates are volatile, fluctuate widely, and are subject to more random disturbances than are long-term 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 also used by foreign governments, companies, and individuals as a temporary safe house for money. Short-term rates are largely administered rates.

As a practical matter, it is inappropriate to relate the return on common stock to the yield on short-term instruments. 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 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.

The level of U.S. Treasury long-term bond yields prevailing in June 2001 was 5.8%.

Q. WHAT BETA DID YOU SELECT FOR YOUR CAPM ANALYSIS?

A. For my beta estimate, I examined the historical betas published by Value Line for various regulated utility groups. The average betas for the various groups are summarized in the table below:

Regulated Utility Group	Average Beta
Water Utilities	0.53
Generation Divested Electric Utilities	0.56
Natural Gas Distribution Utilities	0.60
Natural Gas Transmission Utilities	0.76

Source: Value Line Investment Survey for Windows, 6/2001

The beta estimates range from a low of 0.53 for water utilities to a high of 0.76 for gas transmission utilities, with a midpoint of 0.65.

The beta estimate for water utilities, which constitutes the low end of the range, is downward-biased by the so-called thin trading bias. Because most of the publicly traded water utilities covered by Value Line and that appear in the comparable group shown in Exhibit ____ (RAM-4) are thinly traded and are small-capitalization stocks with a market capitalization well below $500 million for which there is only periodic trading, beta estimates are downward biased. You can actually corroborate this phenomenon by comparing the betas of the larger capitalization water utilities with the group average of 0.53. The average beta of the larger capitalization utilities (>$250 million) is actually 0.61, versus the group average of 0.53. This can be seen on Exhibit ___ (RAM-4).

This thin trading bias occurs because observed returns contain stale information about past period returns rather than current period returns. Intuitively, suppose the stock market index surges forward but an individual company stock price remains unchanged due to lack of trading, the estimated beta is imparted a downward bias. The stock is unable to catch up to market-wide movements and appears to be a lower beta stock. Adjustment for the thin trading effect increases the beta estimate.

Furthermore, the water utility industry is somewhat unstable at this time. Water utility stocks have become increasingly disconnected from overall stock market movements and have been increasingly driven by industry-specific factors in recent years, including consolidation, corporate restructurings, mergers, and environmental compliance burdens. The net result of this "distancing" between the water utility industry and the overall equity market is a downward effect on utility betas, as water utility stocks increasingly reflect factors unique to the industry.

The historical betas of electric utilities are downward-biased as well. Ongoing changes in risk fundamentals are not yet be fully reflected in historical beta estimates. The historical betas of approximately 0.56 reported by Value Line for the electric utility industry are not indicative of future trends in the industry. By construction, backward-looking betas are sluggish in detecting fundamental changes in a company's risk. For example, if an electric utility suddenly experiences a quantum increase in its business risk, as is the case under the stimulus of imminent restructuring and competition, one expects an increase in beta. However, if 60 months of return data are used to estimate beta, only one of the 60 data points reflects the new information, one month after the company experiences its increase in business risk. Thus, the change in risk only has a minor effect on the historical beta. Even one year later, only 12 of the 60 return points reflect the event.

By the same token, I consider the historical beta estimate of 0.76 for gas transmission utilities, which constitutes the high end of the range, upward-biased. As a result of gas deregulation, several of the business risks have shifted from the merchant pipeline to the LDC, and these changes in risk fundamentals have yet to be fully reflected in historical beta estimates.

I use the midpoint of the range, 0.65, as my estimate for the beta applicable to water and wastewater utility operations. This is a conservative approach for the industry as a whole, especially in Florida, where water and wastewater utility companies are comparatively very small in size. This beta estimate is close to the beta for large capitalization water utilities. The midpoint of the range also corresponds to the beta estimate of natural gas distribution utilities. It is not unreasonable to postulate that a water and wastewater utility's operations possess an investment risk profile comparable to that of today's natural gas distribution utility business. Natural gas utility companies possess economic characteristics similar to those of water utilities. They are both involved in the transmission-distribution of regulated infrastructure commodity products at regulated rates in a cyclical and weather-sensitive market. They both employ a capital-intensive network with comparable physical characteristics. They are both subject to rate of return regulation.

Q. WHAT MARKET RISK PREMIUM ESTIMATE DID YOU USE IN YOUR CAPM ANALYSIS?

A. For the market risk premium, I used 7.8%. This estimate was based on the results of both forward-looking and historical studies of long-term risk premiums. Two studies guided the assumed range. First, the Ibbotson Associates study of historical returns from 1926 to 1999 shows that a broad market sample of common stocks outperformed long-term Treasury bonds by 7.8%. Second, a DCF analysis applied to the aggregate equity market indicates a prospective market risk premium of nearly the same magnitude.

Q. WHY DID YOU USE LONG TIME PERIODS IN ARRIVING AT YOUR HISTORICAL MARKET RISK PREMIUM ESTIMATE?

A. 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. This is because realized returns can be substantially different from prospective returns anticipated by investors, especially when measured over short time periods. 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 historical equity risk premium estimated 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 second estimate of the market risk premium, I applied a DCF analysis to the aggregate equity market using Value Line's "Value Line Investment Survey for Windows" ("VLIS") software. The dividend yield on the aggregate market is currently 2.5% (VLIS 4/2001 edition), and the projected growth for the more than 5000 stocks covered by Value Line is in the range of 6.1% to 15.4%. Adding the two components together produces an expected return on the aggregate equity market in the range of 8.6% to 17.9%, with a midpoint of 13.2%. 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 13.5%. Recognition of the quarterly timing of dividend payments rather than the annual timing of dividends assumed in the annual DCF model brings this estimate to approximately 13.7%. The implied risk premium is therefore 7.9% over long-term U.S. Treasury bonds that are currently yielding 5.8%. This estimate is virtually identical to the 7.8% estimate obtained from historical market risk premium data.

Q. WHAT IS YOUR RISK PREMIUM ESTIMATE USING THE CAPM APPROACH?

A. Inserting those input values in the CAPM equation, namely a risk-free rate of 5.8%, a beta of 0.65, and a market risk premium of 7.8%, the CAPM estimate of a typical water company's cost of common equity is: 5.8% + 0.65 x 7.8% = 10.9%. This estimate becomes 11.2% with flotation costs, discussed later in my testimony.

Q. WHAT IS YOUR RISK PREMIUM ESTIMATE USING THE EMPIRICAL VERSION OF THE CAPM?

A. It is well established in the academic finance literature that the CAPM produces a downward-biased estimate of equity cost for companies with a beta of less than 1.00. Expanded CAPMs have been developed which relax some of the more restrictive assumptions underlying the traditional CAPM responsible for this bias, and thereby enrich its conceptual validity. These expanded CAPMs typically produce a risk-return relationship that is "flatter" than the traditional CAPM's prediction, consistent with the empirical findings of the finance literature. 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 5.8% for R_F, a market risk premium of 7.8% for R_M - R_F and a beta of 0.65 in the above equation, the return on common equity is 11.6% without flotation cost and 11.9% with flotation costs.

2. RISK PREMIUM ESTIMATES

Q. DR. MORIN, HOW DID YOU IMPLEMENT YOUR RISK PREMIUM ANALYSIS OF THE REGULATED UTILITY INDUSTRY?

A. Because of the unavailability of historical data over a sufficiently long period of time and because of the heterogeneous nature of the water companies that make up the industry, I examined the risk premiums in the electric and natural gas utility industries. There is a severe shortage of pure-play water utilities whose shares are publicly listed and actively traded, and are therefore subject to the opinions and actions of investors in a measurable way. Given this situation, the need to extend the sample to companies of comparable risk is obvious. Furthermore, from a purely practical viewpoint, the historical Risk Premium approach model is difficult, if not impossible, to apply to water utilities data. There are very few "degrees of freedom" and very few comparable risk pure-play water utilities with clean homogeneous historical financial data extending over sufficiently long time periods, and, therefore, the risk premium results from such studies are likely to prove unreliable, even if data were available to begin with. Therefore, as a surrogate for the risk premiums of the regulated water utility industry, I examined the historical risk premiums of both the electric and natural gas utility industries.

A historical risk premium for the electric utility industry was estimated with an annual time series analysis from 1931 to 1999 applied to the electric utility industry as a whole, using Moody's Electric Utility Index as an industry proxy. The analysis is depicted on Exhibit ____ (RAM-2). The risk premium was estimated by computing the actual return on equity capital for Moody's Index for each year from 1931 to 1999 using the actual stock prices and dividends of the index, and then subtracting the long-term government bond return for that year.

The average risk premium over the period was 5.2% over long-term Treasury bonds. Given that long-term Treasury bonds are currently yielding about 5.8%, the implied cost of equity for the average electric utility from this particular method is 5.8% + 5.2% = 11.0%.

The same risk premium analysis was applied to the natural gas utility industry. A historical risk premium for the natural gas distribution utility industry was estimated with an annual time series analysis from 1955 to 1999 applied to the natural gas distribution industry as a whole, using Moody's Natural Gas Distribution Index as an industry proxy. Data for this particular index was unavailable prior to 1955. 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 1954 to 1999 using the actual stock prices and dividends of the index, and then subtracting the long-term government bond return for that year. The average risk premium over the period was 5.8% over long-term Treasury bonds.

Given that long-term Treasury bonds are currently yielding about 5.8%, the implied cost of equity for the average gas distribution utility from this particular method is 5.8% + 5.8% = 11.6%.

Q. DID YOU ADJUST YOUR RISK PREMIUM RESULTS TO ACCOUNT FOR THE FACT THAT WATER AND WASTEWATER UTILITIES ARE RISKIER THAN THE OTHER REGULATED UTILITIES?

A. Yes, I did. The cost of equity estimate from the two Moody's groups reflects the risk of the average utility. To the extent that the risk premium estimate is drawn from a less risky group of companies, the expected equity return applicable to the water and wastewater industry is downward-biased. I estimate the bias to be of the order of 35 basis points. This adjustment increases the risk premium estimate from 11.0% to 11.4% obtained from the electric utility industry and from 11.6% to 12.0% from the natural gas industry.

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.

The results of empirical studies and theoretical studies indicate that equity costs increase by 8 to 14 basis points per one percentage point increase in the debt ratio.

Finally, and perhaps more importantly, the Ibbotson Associates publication ("Stocks, Bonds, Bills, and Inflation 2000 Yearbook) reports a size premium, that is, the return in excess of the CAPM return, of 35 basis points (0.35%) for micro-capitalization stocks. Most water and wastewater utilities would fall in this category whether or not they were publicly traded.

Q. CAN YOU ELABORATE ON THIS SO-CALLED SIZE EFFECT?

A. Certainly. Water utilities possess small revenue and asset bases and are small in size, both in absolute terms and relative to other utilities. The table below shows the relative size of water, gas, and electric utilities as measured by the average market value of their common equity.

Market Capitalization (millions $)	
Water Utilities	640
Natural Gas Distribution Utilities	1,433
Transmission – Distribution Utilities	3,415
Natural Gas Transmission Utilities	16,263

Source: Value Line Investment Survey 4/2001

As a result of their small size, market information is not easily accessible and analyst coverage is scarce. Standard & Poor's computes indexes for almost 100 different industries but not the water industry. There is only a handful of actively traded water companies. Value Line covers only nine water utilities. Analyst coverage is scarce. To illustrate, IBES International publishes long-term growth forecasts for only 7 water companies and Zacks Investment Research provides long-term growth estimates for only 3 water companies.

The size phenomenon is well documented in the finance literature. Investment risk increases as company size diminishes, all else remaining constant. Reinganum ("Misspecification of Capital Asset Pricing: Empirical Anomalies Based on Earnings, Yields and Market Values," Journal of Financial Economics, 9, no. 1 March 1981) examined the relationship between the size of the firm and its P/E ratio, and found that small firms experienced average returns greater than those of large firms that were of equivalent systematic risk (beta). He found that small firms produce greater returns than could be explained by their risks. These results were confirmed in a separate test by Banz ("The Relationship between Return and Market Value of Common Stock," Journal of Financial Economics, 9, no. 1 March 1981), who examined stock returns over the much longer 1936-1975 period, finding that stocks of small firms earned higher risk-adjusted abnormal returns than those of large firms.

Ibbotson Associates' widely used compilation of historical returns from 1926 to the present reinforces this evidence (see Stocks, Bonds, Bills, and Inflation 2000 Yearbook, Ibbotson Associates, Chicago 2000). 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 approximately 4% 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 had the highest volatility, as measured by the standard deviation of returns.

The size effect is particularly relevant for smaller water utilities whose equity market value is less than $250 million. Not only do these small water utilities possess higher risks than their larger counterparts but they are also subjected to a significant size effect, strongly suggesting that their cost of equity capital is higher.

Q. PLEASE DESCRIBE YOUR ANALYSIS OF ALLOWED RISK PREMIUMS IN THE REGULATED UTILITY INDUSTRY.

A. To estimate a typical water and wastewater utility's cost of common equity, I examined the historical risk premiums implied in the ROEs allowed by regulatory commissions in hundreds of ROE decisions over the period 1987-2000 relative to the contemporaneous level of the long-term Treasury bond yield in both the electric and natural gas utility industry. No such comprehensive data in a statistically meaningful quantity is available for water utility regulatory decisions.

As far as the electric utility industry is concerned, the average ROE spread over long-term Treasury yields was 4.6% for the 1987-2000 time period as shown by the horizontal line in the graph of Exhibit ___ (RAM-7) Page 1. The graph also shows the year-by-year allowed risk premium.

A more careful review of these ROE decisions relative to interest rate trends also 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 1987-2000 period:

$$RP = 0.0772 - 0.422\ YIELD \qquad R^2 = 0.65$$
$$(t = 4.92)$$

The relationship is statistically significant as indicated by the high R^2 and statistically significant t-value of the slope coefficient. The graph on Exhibit ____ (RAM-7) Page 2 shows the 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 5.8% in the above equation suggests a risk premium estimate of 5.3% that would be allowed for the average risk electric utility. The risk premium applicable to a riskier than average water and wastewater utility is understated as discussed earlier. This adjustment would raise the risk premium higher.

As far as the natural gas utility industry is concerned, the average ROE spread over long-term Treasury yields was 4.6% for the 1987-2000 period as shown by the horizontal line in the graph shown on Page 3 of Exhibit ___ (RAM-7). The graph also shows the year-by-year allowed risk premium.

As was the case with the electric utility industry, a more careful review of these ROE decisions relative to interest rates 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 1987-2000 period:

$$RP = 0.0751 - 0.41\ YIELD \qquad R^2 = 0.68$$
$$(t=5.1)$$

The relationship is statistically significant as indicated by the high R^2 and statistically significant t-value of the slope coefficient. The graph shown on Page 4 of Exhibit ___ (RAM-7) shows the 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 5.8% in the above equation suggests a risk premium estimate of 5.2% that would be allowed for an average risk natural gas utility. The risk premium applicable to a riskier water and wastewater utility is understated as discussed earlier. This adjustment would raise the risk premium even higher.

Q. PLEASE SUMMARIZE YOUR RISK PREMIUM ESTIMATES.

A. The table below summarizes the ROE estimates obtained from the various risk premium studies:

RISK PREMIUM STUDY	ROE
CAPM	11.2%
ECAPM	11.9%
Historical Risk Premium Electric	11.4%
Historical Risk Premium Natural Gas	12.0%
Allowed Risk Premium Electric Utilities	11.5%
Allowed Risk Premium Natural Gas Utilities	11.4%

The various risk premium estimates are remarkably convergent and homogeneous within the 11.5% - 12.0% range, attesting to their reliability.

3. 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 during the coming year

P_o = current stock price

g = expected growth rate of future dividends

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 from an estimate of investors' expected future growth.

The assumptions underlying this valuation formulation are well known. The assumptions are discussed in detail in Chapter 4 of my 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 annually when in fact dividend payments are normally made on a quarterly basis.

Q. HOW DID YOU ESTIMATE AN APPROPRIATE COST OF EQUITY WITH THE DCF MODEL?

A. I applied the DCF model to three proxy groups: a group of water utilities drawn from the Value Line Investment Survey coverage, a group of "wires" electric utilities, and a group consisting of widely-traded dividend-paying natural gas distribution companies drawn from the Value Line Gas Distribution Group.

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 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 spot dividend yields reported in the April 2001 edition of VLIS. The vagaries of individual company stock prices are attenuated when using a large group of companies.

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 a proxy for expected growth, I relied mainly on the 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 in Institutional Brokers' Estimate System's ("IBES") monthly publications. I used analysts' long-term growth forecasts contained in IBES as proxies for investors' growth expectations in applying the DCF model. I also used Value Line's growth forecast as an additional proxy.

Q. WHAT DCF RESULTS DID YOU OBTAIN FOR THE WATER UTILITIES GROUP?

A. Exhibit ___ (RAM-4) displays a group of nine water utilities described as "Water Utilities" by Value Line. As shown on Column 4 of page 1 of Exhibit ___ (RAM-4), the average long-term growth forecast obtained from IBES is 5.6% for this group. Adding this growth rate to the average expected dividend yield of 4.2% shown in Column 5 and adding 30 basis points to recognize the quarterly timing of dividend payments[1] produce an estimate of equity costs of 9.8% for the group, unadjusted for flotation costs. Allowance for flotation costs to the results of Column 4 brings the cost of equity estimate to 10.0%, shown in Column 6.

Using Value Line's long-term earnings growth forecast of 7.1% instead of the IBES consensus forecast, the cost of equity is 11.3%, inclusive of flotation costs and

[1] See Morin, R. A., Regulatory Finance, Public Utility Reports Inc., Arlington, VA, 1994, Chapter 7 for a discussion of the quarterly timing adjustment.

the quarterly timing adjustment. This analysis is displayed on page 2 of Exhibit ___ (RAM-4). I note that Value Line growth forecasts are available for only four of the nine companies in the group.

A similar analysis using historical earnings growth instead of analysts' growth forecasts produces a cost of equity estimate of 10.4%, as shown on page 3 of Exhibit ___ (RAM-4).

I consider the DCF results obtained from the water utilities group somewhat unreliable in view of the scarcity of available companies. Moreover, the DCF results are somewhat clouded by pending merger negotiations for several of the water companies in the sample. There is a very strong possibility that the stock price of these companies used as input in the DCF dividend yield component is biased by ongoing merger negotiations. The DCF analysis of these companies is therefore susceptible to the singular vagaries of these particular companies. An abnormally low or high ROE recommendation can result from a biased DCF estimate. It is fairly common practice amongst experts and investment analysts to exclude companies currently involved in merger negotiations when applying the DCF model to a sample of comparable risk companies. Unfortunately, I could not afford the luxury of eliminating companies where the number of publicly traded water utilities is so small to begin with. Hence, there is a need to apply the DCF method to other comparable utility groups.

Q. WHAT DCF RESULTS DID YOU OBTAIN FOR THE GENERATION DIVESTED ELECTRIC UTILITIES GROUP?

A. Exhibit ___ (RAM-5) displays a group of 15 electric utilities labeled "Generation Divestiture Electric Utilities" by Moody's. These are publicly listed parent companies whose electric utility operating subsidiaries have divested generation assets or are in the process of doing so and whose remaining operations are natural regulated monopolies. It is reasonable to postulate that the water and wastewater business possesses an investment risk profile similar to those transmission-distribution ("T&D") utilities that have divested their generation business.

As shown on Column 2 of page 1 of Exhibit ___ (RAM-5), the average long-term growth forecast obtained from IBES is 7.1% for this group. Adding this growth rate to the average expected dividend yield of 5.5% shown in Column 3 produces an estimate of equity costs of 12.7% for the group, unadjusted for flotation costs. Allowance for flotation costs to the results of Column 4 brings the cost of equity estimate to 13.0%, shown in Column 5. Edison International and PG&E were excluded from the group due to the bankruptcy filing of the latter and the interruption of dividends of the former, precipitated by the California energy crisis. Niagara Mohawk was also eliminated due to the interruption of dividends. The truncated average, obtained by removing the low and high estimates from the computation of the average, is 12.8%. Because the water and wastewater utilities are riskier than average on account of their small size, the DCF estimate applicable to this industry is downward-biased as discussed earlier. This adjustment increases the DCF cost of equity estimate.

Using Value Line's long-term earnings growth forecast of 6.8% instead of the IBES consensus forecast, the cost of equity for the generation divestiture electrics is 12.4%, unadjusted for flotation costs. Allowance for flotation costs brings the cost of equity estimate to 12.7%. The truncated average is 13.0%. This analysis is displayed on page 2 of Exhibit ___ (RAM-5). Adjustment for industry's higher than average risk increases this estimate.

In the interest of conservatism, the DCF results for the electric and natural gas utilities do not reflect the quarterly timing of dividend payments.

Q. WHAT DCF RESULTS DID YOU OBTAIN FOR THE GAS DISTRIBUTION UTILITY INDUSTRY USING THE SAME APPROACH?

A. As discussed earlier, as a proxy for a water and wastewater operations, 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-6).

As shown on Column 4 of page 1 of Exhibit ___ (RAM-6), the average long-term growth forecast obtained from the IBES corporate earnings database is 6.6% for the gas distribution group. Adding this growth rate to the average expected dividend yield of 4.8% shown in Column 5 produces an estimate of equity costs of 11.3% for the gas distribution group, unadjusted for flotation costs. Allowance for flotation costs to the results of Column 6 brings the cost of equity estimate to 11.6%, shown in Column 7. The truncated average is 11.5%. Adjustment for higher than average risk increases this estimate.

Repeating the exact same procedure, only this time using Value Line's long-term earnings growth forecast of 9.8% instead of the IBES consensus growth forecast, the cost of equity for gas distribution group is 14.7%, unadjusted for flotation costs. Allowance for flotation costs brings the cost of equity estimate to 14.9%. The truncated average is 14.2%. This analysis is displayed on page 2 of Exhibit ___ (RAM-6). Again, adjustment for industry's higher than average risk increases this estimate.

Q. PLEASE SUMMARIZE YOUR DCF ESTIMATES.

A. The table below summarizes the DCF estimates:

DCF STUDY	ROE
Water Utilities IBES Growth	10.0%
Water Utilities Value Line Growth	11.3%
Water Utilities Historical Growth	10.4%
Transmission – Distribution Electrics IBES Growth	13.2%
Transmission – Distribution Electrics Value Line Growth	13.4%
Natural Gas Distribution IBES Growth	11.9%
Natural Gas Distribution Value Line Growth	14.6%

Q. PLEASE DESCRIBE THE NEED FOR A FLOTATION COST ALLOWANCE.

A. All the market-based estimates (CAPM, Risk Premium, DCF) reported above include an adjustment for flotation cost. 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 incurred, they are not expensed at the time of issue, and therefore must be recovered via a rate of return adjustment. This is routinely done for bond and preferred stock issues by most regulatory commissions. Clearly, the common equity capital accumulated by a utility is not cost-free. The flotation cost allowance to the cost of common equity capital is regularly discussed and applied in most corporate finance textbooks.

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 are not expensed in the past, and therefore the adjustment must continue for the entire time that these initial funds are retained in the firm. Appendix A 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 A, 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 5.6% for utility stocks by 0.95 yields 5.9%, 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 a 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 continues 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 A COMPANY THAT DOES NOT TRADE PUBLICLY AND IS A SUBSIDIARY OF A HOLDING COMPANY?

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. 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 OF RESULTS

Q. PLEASE SUMMARIZE YOUR RESULTS.

A. I performed six 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 four risk premium analyses were performed on historical and allowed risk premium data from both the electric utility and natural gas distribution industries aggregate data. I also performed DCF analyses on three surrogates for the Company: a group representative of the water utility industry, a group of transmission – distribution electric utilities, and a group representative of the natural gas utility industry. The results are summarized in the table below.

STUDY	ROE
CAPM	11.2%
ECAPM	11.9%
Historical Risk Premium Electric	11.4%
Historical Risk Premium Natural Gas	12.0%
Allowed Risk Premium Electric Utilities	11.5%
Allowed Risk Premium Natural Gas Utilities	11.4%
Water Utilities IBES Growth	10.0%
Water Utilities Value Line Growth	11.3%
Water Utilities Historical Growth	10.4%
Transmission – Distribution Electrics IBES Growth	13.2%
Transmission – Distribution Electrics Value Line Growth	13.4%
Natural Gas Distribution IBES Growth	11.9%
Natural Gas Distribution Value Line Growth	14.6%

The DCF analysis performed on the natural gas distributors using Value Line's growth forecast might be considered an outlier, and I have accorded it little weight. The remaining results range from 10.0% to 13.4%, with a midpoint of 11.7% for a typical Florida water and wastewater utility ("FWU") with an average capital structure. Based on the results of all my analyses, the application of my professional judgment, and the risk circumstances of the industry, it is my opinion that a just and reasonable range of returns on common equity is 10.0% to 13.4% with a midpoint of 11.7% for a typical FWU with an average capital structure.

Q. HOW SHOULD THE COMMISSION DETERMINE A FAIR RATE OF RETURN ON EQUITY FOR THE VARIOUS FWUs UNDER ITS JURISDICTION?

A. The Commission can do this in one of two ways. One way is to adjust the cost of common equity for the degree of leverage of the individual utility. Another would be to amend the Commission's leverage formula so that it produces results that match the cost of common equity results described above. I will describe each approach in turn.

Q. WHAT IS THE MAGNITUDE OF THE REQUIRED ADJUSTMENT TO ACCOUNT FOR A CAPITAL STRUCTURE WHICH DIFFERS FROM THE AVERAGE INDUSTRY CAPITAL STRUCTURE?

A. As far as the first alternative is concerned, FWUs with low common equity ratios (high leverage) should be accorded a return near the top end of the range while FWUs with high common equity ratios (low leverage) should be accorded a return near the bottom end of the range.

It is a rudimentary tenet of basic finance that the greater (lower) the amount of financial risk borne by common shareholders, the greater (lower) the return required by shareholders in order to be compensated for the added (diminished) financial risk imparted by the greater (lower) use of senior debt financing. In other words, the greater the debt ratio, the greater the return required by equity investors. The converse is, of course, true as well.

Several researchers have studied the empirical relationship between the cost of capital, capital-structure changes, and the value of the firm's securities. Comprehensive and rigorous empirical studies of the relationship between cost of capital and leverage for public utilities are summarized in Morin, Regulatory Finance, Public Utilities Report, Inc., Arlington, VA, 1994, Chapter 17.

The results of empirical studies and theoretical studies obtained when the debt ratio increases from 40% to 50% indicate that equity costs increase from a low of 34 to a high of 237 basis points. The average increase is 138 basis points from the theoretical studies and 76 basis points from the empirical studies, or a range of 7.6 to 13.8 basis points per one percentage point increase (decrease) in the debt (common equity) ratio. The more recent studies indicate that the upper end of that range is more indicative of the repercussions on equity costs.

According to the PAA Order, the average capital structure for the barometer group of water utilities used in the Commission's leverage formula consists of 43.66% common equity. To the extent that an individual FWU's common equity ratio is less than 43.66%, an upward adjustment to the 11.7% cost of common equity for the average water utility should be made. For example, for a weaker than average FWU with a common equity ratio of 40%, the required upward adjustment to the cost of equity ranges from 7.6 to 13.8 basis points times 3.66%, which equals 28 to 51 basis points. The capital structure difference, 3.66%, is determined as follows: 43.66% - 40.00% = 3.66%. The midpoint of this adjustment range is 40 basis points. The cost of equity becomes 11.7% + 0.4% = 12.1%.

The reverse is true as well. To the extent that a FWU's common equity ratio is more than 43.66%, a downward adjustment to the 11.7% cost of common equity for the average water utility is required. For a stronger than average FWU with a common equity ratio of let us say 50%, the required downward adjustment to the cost of equity ranges from 7.6 to 13.8 basis points times 6.34%, which equals 48 to 87 basis points. The capital structure difference, 6.34%, is determined as follows: 50.00% - 43.66% = 6.34%. The midpoint of the adjustment range is 68 basis points. The cost of equity becomes 11.70% - 0.68% = 11.02%.

In sum, the 11.7% midpoint of my recommended range should be adjusted to reflect a particular FWU's capital structure. For typical capital structures that range from a 60% common equity ratio to a 30% common equity ratio, the cost of common equity varies from about 10% to 13%, which matches almost exactly the range of the results I obtained from the various methodologies used to determine the cost of common equity.

IV. LEVERAGE FORMULA METHODOLOGY

Q. HOW DOES THE COMMISSION ESTABLISH THE ROE FOR FLORIDA WATER UTILITIES?

A. Since 1981, the Commission has established a leverage formula each year which is intended to reasonably reflect the range of returns on common equity (ROE) for an average FWU. Private FWUs are then authorized to apply this leverage formula to their capital structure rather than file expert cost of capital testimony in each rate proceeding.

Q. PLEASE DESCRIBE THE COMMISSION'S LEVERAGE FORMULA.

A. The Commission's leverage formula provides an automated generic mechanism for determining the allowable ROE for the average FWU and for adjusting the authorized ROE to reflect the degree of financial leverage of each FWU, within a prescribed range of common equity ratios. Given that there are no FWUs whose common stock is publicly-traded and given that traditional market information (stock price, earnings per share, beta, bond rating, etc.) is lacking, an indirect approach is required. The leverage formula and the attendant ROE determination process are described in the PAA Order.

The current leverage formula to determine the cost of equity (k_e) for a given equity ratio (ER) is:

$$k_e = 8.41\% + 0.731 / ER$$

The ROEs obtained from the above formula at equity ratios ranging from 100% to 40% is 9.14% to 10.24% for 2001.

Q. DO YOU THINK THAT FLORIDA WATER UTILITIES POSSESS THE SAME DEGREE OF RISK AS THE NATIONAL AVERAGE?

A. No, I do not. While the assumption that all FWUs have similar business risk is reasonable and allows the Commission to adopt a single leverage formula for all FWUs, the assumption that they are similar in risk to the national industry at large, as proxied by the index of water companies used by the Commission, is not warranted.

FWUs are significantly riskier than the national industry. FWUs are different than those in other states because they are generally much smaller, have less access to capital markets and are subjected to additional regulatory risks in the form of used and useful adjustments, high levels of CIAC, and substantial concerns about future water supplies and deterioration of existing supplies.

Compared to the companies used in the index, the FWUs are considerably smaller in size (revenues, net plant, rate base) than the index water companies. The FWUs have very limited access to capital markets, generate less internal funds than their larger counterparts, and are forced to borrow through personal guarantees and/or private placements. They have a significantly larger proportion of contributed property as compared to net plant, which also makes them riskier.

Q. DO YOU HAVE ANY RESERVATIONS REGARDING THE USE OF THE COMMISSION'S LEVERAGE FORMULA?

A. Yes, I do. Although I generally endorse the notion of a generic mechanistic approach to the determination of a fair ROE and although I applaud the Commission's many improvements to the formula through the years, I still have concerns that the results produced by the formula are unrealistically low and are not responsive to the risks of the water utility industry, both in an absolute sense and relative to other Florida utilities. For 2001, the ROE authorized range for FWUs is only 9.14% to 10.24%, at 100% and 40% common equity ratio, respectively. For the last several years, the ROEs authorized under the leverage formula have been below those authorized for the much larger and financially strong electric, gas, and telephone utilities despite the substantial increase in the risk of the water utility industry.

Q. DR. MORIN, PLEASE COMMENT ON THE RELATIVE INVESTMENT RISKS OF THE WATER AND ELECTRIC & GAS UTILITY INDUSTRIES.

A. In a Commission workshop held on February 23, 1995, I provided the Commission with an overview of the relative investment risks of the water and electric-gas utility industry in a paper entitled <u>Return on Common Equity Determination for Florida Water & Wastewater Utilities</u>. The paper described how changes in the operating environment of FWUs have increased their investment risk and their cost of capital, both in absolute terms and relative to other utilities. The changing investment risk of water utilities relative to other utilities was analyzed by examining trends in key financial variables.

Q. WHAT DID YOUR EXAMINATION REVEAL ON THE RELATIVE RISK STATUS OF THOSE INDUSTRIES?

A. My examination revealed that water utilities are riskier than in prior years, both in absolute terms and relative to energy utilities. Therefore, rate of return awards should reflect the divergent trends of the water and energy utility industry.

FWUs are very small in size and their securities possess very low market visibility and very low liquidity on capital markets. Compliance with the various environmental problems, regulations and the securing of added sources of water supply will necessitate large additional capital requirements and will also result in significant increases in operating expenses.

A large portion of those supplementary capital needs will have to be financed externally, thus increasing the industry's financial exposure and financial risks. The investor-owned water utilities are much more dependent on external financing than are gas and electric utilities, and this dependence will increase further as water companies increase their capital investments to comply with new water standards.

Standard comparative measures of market valuation for the water utility industry, such as the pre-tax interest coverage ratios, market-to-book (M/B) ratios, and price-earnings (P/E) ratios, have been at or below those for the other utilities.

Both realized returns on average equity and authorized returns on equity for the water industry are lower than for the gas and electric industries, in spite of the relative reversal in risk between water and energy utilities.

Because of inadequate authorized returns, rising operating expenses and low internal cash generation, the water industry's operating income has been gradually eroding, in spite of a growing rate base. As a result of declining earning power, deteriorating cash flow relative to capital expenditures, falling pre-tax interest coverage ratios and falling realized returns on equity, stock prices relative to book value have declined relative to electric utilities.

This comparative financial profile demonstrates clearly that the risks of water utilities are at least equal to those of the energy utilities and that ROE awards should reflect those circumstances.

Q. WHY HAVE THE INVESTMENT RISKS OF FWUs ESCALATED?

A. The major reasons why the investment risks of FWUs have increased, and will continue to increase, include the following:

1. Water quality regulations. Evolving water quality regulations have generated additional substantial capital and operational costs. These compliance costs increase the utility's operating and financial leverage, which in turn increase the utility's risk and cost of capital.

The final financial effects of the Safe Drinking Water Act (SDWA) on water utilities remain uncertain. Water companies will need to continue upgrading their facilities to comply with evolving environmental standards. Because the standards are still evolving and are yet to be fully determined, there are uncertainties related to upgrading and compliance costs. Some plants presently in use do not comply with newly regulated contaminant levels. Consequently, new plants may have to be installed to meet new standards.

2. Uncertainty regarding future demand. In earlier years when water supplies were abundant, the conservation ethic was absent, and rates were stable, forecasting demand for water was straightforward. Now, there is far greater uncertainty about future demand. Higher service rates resulting from supply adjustment charges and from increased water regulation compliance costs will cause customers to curtail demand for water, compounding the forecasting risk. Moreover, the Commission, Water Management Districts, and the Department of Environmental Protection are all strongly encouraging and even requiring implementation of conservation rate structures and other programs.

3. Uncertainty regarding future supply. Water supply issues and shortages are noteworthy in Florida. Uncertainty about availability and reliability of water supplies abounds. Fears of water shortages and uncertainty about rates are also problems. Recent and continuing questions about the availability and costs of water supplies suggest that this uncertainty will continue.

4. Earnings erosion. Water utilities are exposed to the risk of long run earnings decline and deteriorating quality. The predictability of reported earnings

will deteriorate due to the volatility of earnings over time and the probability of a permanent erosion of earnings power. Increased financial leverage from financing the capital required by more stringent water quality requirements compounds the problem, and even a small decline in operating income can cause low earnings and impact the cost of capital.

5. Water Safety. The issues of water quality, facility closings, and environmental accidents have heightened investors' awareness of water safety. Contamination of drinking water from salt water intrusion, toxic waste dumping, pesticides, and agricultural fertilizers are major concerns. Compliance with evolving water quality standards will make licensure of new plants more difficult and existing facilities may be closed permanently or for prolonged modifications.

6. Regulatory risks. How will regulators respond to the substantial changes in the water utility industry? Will the allowed ROE respond to increased risks faced by water utilities? Will innovative rate designs and automatic adjustment clauses result? Or will prudence questions and possible exclusions of investments from rate base prevail? If regulators succumb to the temptation to exclude some compliance plant investment from rate base, a portion of investor-supplied capital will have no earning power.

7. Construction risk. The term construction risk refers to the financial risks caused by the magnitude of a company's capital budget. Water utilities typically have a large construction program relative to their size. The large

compliance capital expenditures program over the next several years, relative to size, will increase their dependence on capital markets which have become volatile and more unpredictable.

Clearly, FWUs will require substantial external financing in the near future, and it is imperative that these companies have access to needed capital funds on reasonable terms and conditions. The companies must secure funds from capital markets in order to fund new construction commitments irrespective of capital market conditions, interest rates conditions, and quality consciousness of market participants. The return allowed on common equity will play a crucial role in determining those terms and conditions.

On debt markets, construction is one of several key determinants of credit quality and, hence, of capital costs. Future construction plans are scrutinized by lenders before assessing credit quality of a company. The construction budget in relation to internal cash generation is a key quantitative determinant of credit quality, along with construction expenditures as a proportion of capitalization.

Of course, construction risk and regulatory risk are directly related. Because of large new construction programs over the next few years, rate relief requirements and regulatory treatment uncertainty will increase regulatory risks. Generally, regulatory risks include approval risks, lags and delays, potential rate base exclusions and potential disallowances. Moreover, regulators must compensate the FWU companies for the lack of liquidity of their securities in the marketplace. Allowed rates of return should reflect their small size and the relatively illiquid nature of their stock and bond offerings.

Based on these financial trends and new socio-political and economic forces, the FWUs clearly confront higher risks and higher costs of capital.

Q. PLEASE DESCRIBE THE FUNDAMENTAL RELATIONSHIP BETWEEN COST OF CAPITAL AND LEVERAGE INHERENT IN THE COMMISSION'S LEVERAGE FORMULA.

A. Assuming perfectly functioning capital markets and the absence of corporate taxes, Modigliani-Miller (MM) have shown that the cost of capital is independent of capital structure. If the overall cost of capital remains unchanged with leverage, it follows that the required return on equity resulting from the added risk of leverage completely offsets the low-cost advantage of debt. Otherwise, the weighted average cost of capital ("WACC") could not remain constant. The exact relationship between leverage and the cost of equity is linear and is expressed as:

$$K_e = \rho + (\rho\text{-}i)\ D/S \qquad (1)$$

where ρ, is the cost of equity for an all-equity firm, D/S is the leverage ratio, and 'i' is the current rate of interest. This equation states the cost of equity is equal to the cost of capital of an unlevered (no debt) firm plus the after-tax difference between the cost of capital of an unlevered firm and the cost of debt, weighted by the leverage ratio. The cost of equity rises with the debt-equity ratio in a linear fashion, with the slope of the line equal to (ρ-i) D/S. This is the capital structure model inherent in the

Commission's leverage formula. As discussed below, this formula produces the lowest cost of equity estimate of all the conceptual approaches.

Q. ARE THERE ANY OTHER CONCEPTUAL FRAMEWORKS WHICH FORMALLY RELATE THE COST OF CAPITAL AND LEVERAGE?

A. Yes. There are several other formulations of the formal relationship between the cost of capital and leverage. Introducing corporate income taxes, the implied relationship between the cost of equity and leverage remains linear as in the no-tax situation of Equations 1, but the rate of increase (slope) is lessened by the tax advantage of debt. Equation 1 becomes:

$$K_e = \rho + (\rho - i)(1-T)\ D/S \qquad (2)$$

Miller (1977) explored the effect of personal taxes, in addition to corporate taxes, on the overall cost of capital and concluded that, when personal tax effects are considered, the tax advantages of debt financing dissipate. By introducing both corporate and personal taxes into the analysis, Miller found the following relationship between the cost of equity and financial leverage, which bears a close family resemblance to the MM version in Equation 2, which only considers corporate taxes:

$$K_e = \rho + [\rho - i(1-T)]\ D/S \qquad (3)$$

There is yet another framework linking the cost of equity to leverage. Earlier, the CAPM was discussed and took the following form:

$$K = R_F + \beta\,(R_M - R_F) \qquad (4)$$

The beta risk measure of the company can in turn be decomposed into a business risk and a financial risk component. The fundamental idea is contained in the following relationship:

OBSERVED BETA = BUSINESS RISK BETA + FINANCIAL RISK PREMIUM

The following equation formally expresses the decomposition of observed beta to a business risk-related component, or "unlevered beta", and a financial risk component related to the use of debt financing:

$$\beta_L = \beta_U [1 + (1\text{-}T)\, D/S] \qquad (5)$$

where β_L is the observed levered beta of a company, β_U is the unlevered beta of the same company with no debt in its capital structure, D/S is the ratio of debt to equity, and T is the corporate income tax rate.

Substituting the above equation into the CAPM for β_L produces the following relationship between the cost of equity and leverage:

$$K = R_F + \beta_U [1 + (1\text{-}T)\, D/S](R_M - R_F) \qquad (6)$$

A similar relationship can be obtained using the empirical version of the CAPM ("ECAPM") described in Chapter 13 of my book, <u>Regulatory Finance</u>.

In a nutshell, we have five formal relationships linking the cost of equity to leverage: MM with no tax, MM with tax, Miller, CAPM and ECAPM. The Commission's leverage formula produces the lowest cost of equity estimate from among all the various conceptual frameworks while the Miller framework produces results at the other end of the spectrum.

Q. HOW CAN THE COMMISSION RECONCILE THE DISCREPANCY IN THE RESULTS BETWEEN THE VARIOUS CONCEPTUAL APPROACHES?

A. One reasonable suggestion for remedying these discrepancies is to amend the leverage formula so as to produce the same result as the average from all the five frameworks.

Q. DO YOU AGREE WITH THE COST OF DEBT ASSUMPTION IN THE COMMISSION'S LEVERAGE FORMULA?

A. No, I do not. The leverage formula assumes that the cost of debt remains invariant over a common equity ratio ranging from 100% all the way up to 40%. This assumption is unrealistic. Surely, the cost of debt is higher for a company with 40% equity than for a company which has no debt at all. The leverage formula should allow for the rising cost of debt as leverage rises.

One way to accomplish the adjustment is to allow the cost of debt to vary in a linear fashion over this range by plus or minus 50 basis points from the average cost of debt assumed at a 40% common equity ratio. So, for example, if the assumed average cost of debt is 8%, the cost of debt is allowed to vary from a low of 7.5% for a company with 100% equity to a high of 8.5% for a company with 40% common equity.

I also believe that there is nothing magical about the 40% common equity floor imposed by the formula. While I sympathize with the Commission's desire to discourage the employment of high leverage, there is nothing imprudent or unusual about higher dosages of debt. The very small private FWUs do not have access to the equity markets, generate limited internal funds, and therefore must resort to the private debt markets for funding, particularly in light the SDWA compliance requirements. I recommend that the 40%-100% common equity constraint be relaxed to a lower level, perhaps to 30% - 100%.

Q. PLEASE DESCRIBE THE SECOND METHOD BY WHICH THE COMMISSION CAN DETERMINE A FAIR RATE OF RETURN ON EQUITY FOR THE VARIOUS FWUs UNDER ITS JURISDICTION?

A. Earlier, I mentioned that the Commission can do this in one of two ways. One way is to adjust the cost of common equity for the degree of leverage of the individual utility as previously described. Until a formal reexamination of the leverage formula is completed, another way to determine the cost of equity is to amend the Commission's leverage formula so that it produces results that match the cost of common equity results described above.

The current leverage formula to determine the cost of equity (k_e) for a given equity ratio (ER) is:

$$k_e = 8.41\% + 0.731 / ER$$

The ROEs obtained from the above formula at equity ratios ranging from 100% to 40% is 9.14% to 10.24% for 2001. In order to produce the midpoint ROE of 11.7% applicable to the average water utility company used in developing the leverage formula, the above formula can be solved for the mathematical constant that will produce a cost of equity of 11.7% with an average common equity ratio of 43.66%. Until a formal review is completed, the new leverage formula becomes

$$k_e = 8.41\% + 1.436 / ER$$

As a check, inserting the average common equity ratio of 43.66% in the amended formula, the cost of equity is indeed 11.7%. The ROE obtained from the above formula at equity ratios ranging from 100% to 40% is about 10% to 12%.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

APPENDIX A

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%. Adding the two effects, the indicated total flotation cost allowance is above 5.0%, corroborating the results of earlier studies.

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 my DCF estimates of fair return on equity, it was 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 6-8 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 6-8 shows the flotation cost adjustment process using illustrative, yet realistic, market data. The assumptions used in the computation are shown on page 6. 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 $ROE = D/P(1\text{-}f) + g = .09/.95 + .05 = 14.47\%$.

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 7, 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 8. 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 = (D/P + g)	**14.00%**
ALLOWED RETURN ON EQUITY = (D/P(1-f) + g)	**14.47%**

COMPANY EARNS FLOTATION-ADJUSTED COST OF EQUITY
APPLIED ON ALL COMMON EQUITY
BEGINNING OF YEAR

YEAR	COMMON STOCK (1)	RETAINED EARNINGS (2)	TOTAL EQUITY (3)	STOCK PRICE (4)	MARKET/ BOOK RATIO (5)	EPS (6)	DPS (7)	PAYOUT (8)	CHANGE EARNINGS RETAINED (9)
--------	--------	--------	--------	--------	--------	--------	--------	--------	--------
1	$23.75	$0.000	$23.750	$25.000	1.0526	$3.438	$2.250	65.45%	$1.188
2	$23.75	$1.188	$24.938	$26.250	1.0526	$3.609	$2.363	65.45%	$1.247
3	$23.75	$2.434	$26.184	$27.563	1.0526	$3.790	$2.481	65.45%	$1.309
4	$23.75	$3.744	$27.494	$28.941	1.0526	$3.979	$2.605	65.45%	$1.375
5	$23.75	$5.118	$28.868	$30.388	1.0526	$4.178	$2.735	65.45%	$1.443
6	$23.75	$6.562	$30.312	$31.907	1.0526	$4.387	$2.872	65.45%	$1.516
7	$23.75	$8.077	$31.827	$33.502	1.0526	$4.607	$3.015	65.45%	$1.591
8	$23.75	$9.669	$33.419	$35.178	1.0526	$4.837	$3.166	65.45%	$1.671
9	$23.75	$11.340	$35.090	$36.936	1.0526	$5.079	$3.324	65.45%	$1.754
10	$23.75	$13.094	$36.844	$38.783	1.0526	$5.333	$3.490	65.45%	$1.842
			5.00%	**5.00%**		**5.00%**	**5.00%**		**5.00%**

COMPANY DOES NOT EARN THE FLOTATION-ADJUSTED COST OF EQUITY

YEAR	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%	

RESUME OF ROGER A. MORIN

(Summer 2001)

NAME: Roger A. Morin

ADDRESS: 10403 Big Canoe
Jasper, GA 30143, USA

TELEPHONE: (706) 579-1480 business office
(706) 579-1481 business fax
(404) 651-2674 office-university

E-MAIL ADDRESS: profmorin@msn.com

DATE OF BIRTH: 3/5/1945

PRESENT EMPLOYER: Georgia State University
Robinson College of Business
Atlanta, GA 30303

RANK: Distinguished Professor of Finance

HONORS: Professor of Finance for Regulated Industry & Director Center for the Study of Regulated Industry, College of Business, Georgia State University.

EDUCATIONAL HISTORY

- Bachelor of Electrical Engineering, McGill University, Montreal, Canada, 1967.
- Master of Business Administration, McGill University, Montreal, Canada, 1969.
- PhD in Finance & Econometrics, Wharton School of Finance, University of Pennsylvania, 1976.

EMPLOYMENT HISTORY

- Lecturer, Wharton School of Finance, Univ. of Pa., 1972-3
- Assistant Professor, University of Montreal School of Business, 1973-1976.
- Associate Professor, University of Montreal School of Business, 1976-1979.
- Professor of Finance, Georgia State University, 1979-2001
- Professor of Finance for Regulated Industry and Director, Center for the Study of Regulated Industry, College of Business, Georgia State University, 1985-2001
- Visiting Professor of Finance, Amos Tuck School of Business, Dartmouth College, Hanover, N.H., 1986

OTHER BUSINESS ASSOCIATIONS

- Communications Engineer, Bell Canada, 1962-1967.
- Member of the Board of Directors, Financial Research Institute of Canada, 1974-1980.
- Co-founder and Director Canadian Finance Research Foundation, 1977.
- Vice-President of Research, Garmaise-Thomson & Associates, Investment Management Consultants, 1980-1981.
- Executive Visions Inc., Board of Directors, Member
- Board of External Advisors, College of Business, Georgia State University, Member 1987-1991

CORPORATE CONSULTING CLIENTS

AT & T Communications

Alagasco - Energen

Alaska Anchorage Municipal Light & Power

Alberta Power Ltd.

American Water Works Company

Ameritech

Baltimore Gas & Electric

B.C. Telephone

B C GAS

Bell Canada

Bellcore

Bell South Corp.

Bruncor (New Brunswick Telephone)

Burlington-Northern

C & S Bank

Cajun Electric

Canadian Radio-Television & Telecomm. Commission

Canadian Utilities

Canadian Western Natural Gas

Centel

Centra Gas

Central Illinois Light & Power Co

Central Telephone

Central South West Corp.

Cincinnatti Gas & Electric

Cinergy Corp

CORPORATE CONSULTING CLIENTS (CONT'D)

Citizens Utilities

City Gas of Florida

CN-CP Telecommunications

Commonwealth Telephone Co.

Columbia Gas System

Constellation Energy

Deerpath Group

Edison International

Edmonton Power Company

Engraph Corporation

Entergy Corp.

Entergy Gulf States Utilities, Inc.

Entergy Louisiana, Inc.

Florida Water Association

Garmaise-Thomson & Assoc., Investment Consultants

Gaz Metropolitain

General Public Utilities

Georgia Broadcasting Corp.

Georgia Power Company

GTE California

GTE Northwest Inc

GTE Service Corp.

GTE Southwest Incorporated

Gulf Power Company

Havasu Water Inc.

Hope Gas Inc.

CORPORATE CONSULTING CLIENTS (CONT'D)

Hydro-Quebec

ICG Utilities

Illinois Commerce Commission

Island Telephone

Jersey Central Power & Light

Kansas Power & Light

Manitoba Hydro

Maritime Telephone

Metropolitan Edison Co.

Minister of Natural Resources Province of Quebec

Minnesota Power & Light

Mississippi Power Company

Mountain Bell

Newfoundland Light & Power - Fortis Inc.

NewTel Enterprises Ltd.

New York Telephone Co.

Northern Telephone Ltd.

Northwestern Bell

Northwestern Utilities Ltd.

Nova Scotia Board of Utilities

NUI Corp

NYNEX

Oklahoma G & E

Ontario Telephone Service Commission

Orange & Rockland

Pacific Northwest Bell

CORPORATE CONSULTING CLIENTS (CONT'D)

People's Gas System Inc.

People's Natural Gas

Pennsylvania Electric Co.

Price Waterhouse

PSI Energy

Public Service Elec & Gas

Quebec Telephone

Rochester Telephone

SaskPower

Sierra Pacific Resources

Southern Bell

Southern States Utilities

South Central Bell

Sun City Water Company

The Southern Company

Touche Ross and Company

Trans-Quebec & Maritimes Pipeline

US WEST Communications

Utah Power & Light

Vermont Gas Systems Inc.

MANAGEMENT DEVELOPMENT AND PROFESSIONAL EXECUTIVE EDUCATION

- Canadian Institute of Marketing, Corporate Finance, 1971-73
- Hydro-Quebec, "Capital Budgeting Under Uncertainty, 1974-75
- Institute of Certified Public Accountants, Mergers & Acquisitions, 1975-78

- Investment Dealers Association of Canada, 1977-78
- Financial Research Foundation, bi-annual seminar, 1975-79
- Advanced Management Research (AMR), faculty member, 1977-80
- Financial Analysts Federation, Educational chapter: "Financial Futures Contracts" seminar
- The Management Exchange Inc., faculty member, 1981-2000.

NATIONAL SEMINARS:

Risk and Return on Capital Projects
Cost of Capital for Regulated Utilities
Capital Allocation for Utilities
Alternative Regulatory Frameworks
Utility Directors' Workshop
Shareholder Value Creation for Utilities
Real Options in Utility Capital Investments
Fundamentals of Utility Finance

- Georgia State University College of Business, Management Development Program, faculty member, 1981-1994

EXPERT TESTIMONY & UTILITY CONSULTING AREAS OF EXPERTISE

Rate of Return

Capital Structure

Generic Cost of Capital

Phase-in Plans

Costing Methodology

Depreciation

Flow-Through vs Normalization

Revenue Requirements Methodology

Utility Capital Expenditures Analysis

Risk Analysis

Capital Allocation

Divisional Cost of Capital, Unbundling

Publicly-owned Municipals

Telecommunications, CATV, Energy, Pipeline, Water

Incentive Regulation & Alternative Regulatory Plans

Shareholder Value Creation

Value-Based Management

REGULATORY BODIES:

Federal Communications Commission

Federal Energy Regulatory Commission

Georgia Public Service Commission

South Carolina Public Service Commission

North Carolina Utilities Commission

Pennsylvania Public Service Commission

Ontario Telephone Service Commission

Quebec Telephone Service Commission

Newfoundland Board of Commissioners of Public Utilities

Georgia Senate Committee on Regulated Industries

Alberta Public Service Board

Tennessee Public Service Commission

Oklahoma State Board of Equalization

Mississippi Public Service Commission

Minnesota Public Utilities Commission

Canadian Radio-Television and Telecomm. Commission

New Brunswick Board of Public Commissioners

Alaska Public Utility Commission

National Energy Board of Canada

Florida Public Service Commission

Montana Public Service Commission

Arizona Corporation Commission

Quebec Natural Gas Board

New York Public Service Commission

Washington Utilities & Transportation Commission

Manitoba Board of Public Utilities

New Jersey Board of Public Utilities

Alabama Public Service Commission

Utah Public Service Commission

Nevada Public Service Commission

Louisiana Public Service Commission

Colorado Public Utilities Board

West Virginia Public Service Commission

Ohio Public Utilities Commission

California Public Service Commission

Hawaii Public Service Commission

Illinois Commerce Commission

British Columbia Board of Public Utilities

Indiana Utility Regulatory Commission

Minnesota Public Utilities Commission

Texas Public Service Commission

Michigan Public Service Commission

SERVICE AS EXPERT WITNESS

Southern Bell, So. Carolina PSC, Docket #81-201C

Southern Bell, So. Carolina PSC, Docket #82-294C

Southern Bell, North Carolina PSC, Docket #P-55-816

Metropolitan Edison, Pennsylvania PUC, Docket #R-822249

Pennsylvania Electric, Pennsylvania PUC,Docket#R-822250

Georgia Power, Georgia PSC, Docket # 3270-U, 1981

Georgia Power, Georgia PSC, Docket # 3397-U, 1983

Georgia Power, Georgia PSC, Docket # 3673-U, 1987

Georgia Power, F.E.R.C., Docket # ER 80-326, 80-327

Georgia Power, F.E.R.C., Docket # ER 81-730, 80-731

Georgia Power, F.E.R.C., Docket # ER 85-730, 85-731

Bell Canada, CRTC 1987

Northern Telephone, Ontario PSC

GTE-Quebec Telephone, Quebec PSC, Docket 84-052B

Newtel., Nfld. Brd of Public Commission PU 11-87

CN-CP Telecommunications, CRTC

Quebec Northern Telephone, Quebec PSC

Edmonton Power Company, Alberta Public Service Board

Kansas Power & Light, F.E.R.C., Docket # ER 83-418

NYNEX, FCC generic cost of capital Docket #84-800

Bell South, FCC generic cost of capital Docket #84-800

American Water Works - Tennessee, Docket #7226

Burlington-Northern - Oklahoma State Board of Taxes

Georgia Power, Georgia PSC, Docket # 3549-U

GTE Service Corp., FCC Docket #84-200

Mississippi Power Co., Miss. PSC, Docket U-4761

Citizens Utilities, Ariz. Corp. Comm., D # U2334-86020

Quebec Telephone, Quebec PSC, 1986, 1987, 1992

Newfoundland L & P, Nfld. Brd. Publ Comm. 1987, 1991

Northwestern Bell, Minnesota PSC, #P-421/CI-86-354

GTE Service Corp., FCC Docket #87-463

Anchorage Municipal Power & Light, Alaska PUC, 1988

New Brunswick Telephone, N.B. PUC, 1988

Trans-Quebec Maritime, Nat'l Energy Brd. of Cda, '88-92

Gulf Power Co., Florida PSC, Docket #88-1167-EI

Mountain States Bell, Montana PSC, #88-1.2

Mountain States Bell, Arizona CC, #E-1051-88-146

Georgia Power, Georgia PSC, Docket # 3840-U, 1989

Rochester Telephone, New York PSC, Docket # 89-C-022

Noverco - Gaz Metro, Quebec Natural Gas PSC, #R-3164-89

GTE Northwest, Washington UTC, #U-89-3031

Orange & Rockland, New York PSC, Case 89-E-175

Central Illinois Light Company, ICC, Case 90-0127

Peoples Natural Gas, Pennsylvania PSC, Case

Gulf Power, Florida PSC, Case # 891345-EI

ICG Utilities, Manitoba BPU, Case 1989

New Tel Enterprises, CRTC, Docket #90-15

Peoples Gas Systems, Florida PSC

Jersey Central Pwr & Light, N.J. PUB, Case ER 89110912J

Alabama Gas Co., Alabama PSC, Case 890001

Trans-Quebec Maritime Pipeline, Cdn. Nat'l Energy Board

Mountain Bell, Utah PSC,

Mountain Bell, Colorado PUB

South Central Bell, Louisiana PS

Hope Gas, West Virginia PSC

Vermont Gas Systems, Vermont PSC

Alberta Power Ltd., Alberta PUB

Ohio Utilities Company, Ohio PSC

Georgia Power Company, Georgia PSC

Sun City Water Company

Havasu Water Inc.

Centra Gas (Manitoba) Co.

Central Telephone Co. Nevada

AGT Ltd., CRTC 1992

BC GAS, BCPUB 1992

California Water Association, California PUC 1992

Maritime Telephone 1993

BCE Enterprises, Bell Canada, 1993

Citizens Utilities Arizona gas division 1993

PSI Resources 1993-5

CILCORP gas division 1994

GTE Northwest Oregon 1993

Stentor Group 1994-5

Bell Canada 1994-1995

PSI Energy 1993, 1994, 1995, 1999

Cincinnati Gas & Electric 1994, 1996, 1999

Southern States Utilities, 1995

CILCO 1995, 1999

Commonwealth Telephone 1996

Edison International 1996-8

Citizens Utilities 1997

Stentor Companies 1997

Hydro-Quebec 1998

Entergy Gulf States Louisiana 1998

Detroit Edison, 1999

Entergy Gulf States, Texas, 2000

PROFESSIONAL AND LEARNED SOCIETIES

- Engineering Institute of Canada, 1967-1972
- Canada Council Award, recipient 1971 and 1972
- Canadian Association Administrative Sciences,1973-80
- American Association of Decision Sciences, 1974-1978
- American Finance Association, 1975-2001
- Financial Management Association, 1978-2001

ACTIVITIES IN PROFESSIONAL ASSOCIATIONS AND MEETINGS

- Chairman of meeting on "New Developments in Utility Cost of Capital", Southern Finance Association, Atlanta, Nov. 1982
- Chairman of meeting on "Public Utility Rate of Return", Southeastern Public Utility Conference, Atlanta, Oct. 1982
- Chairman of meeting on "Current Issues in Regulatory Finance", Financial Management Association, Atlanta, Oct. 1983
- Chairman of meeting on "Utility Cost of Capital", Financial Management Association, Toronto, Canada, Oct. 1984.
- Committee on New Product Development, FMA, 1985
- Discussant, "Tobin's Q Ratio", paper presented at Financial Management Association, New York, N.Y., Oct. 1986
- Guest speaker, "Utility Capital Structure: New Developments", National Society of Rate of Return Analysts 18th Financial Forum, Wash., D.C. Oct. 1986
- Opening address, "Capital Expenditures Analysis: Methodology vs Mythology," Bellcore Economic Analysis Conference, Naples Fla., 1988.

PAPERS PRESENTED:

"An Empirical Study of Multiperiod Asset Pricing," annual meeting of Financial Management Assoc., Las Vegas Nevada, 1987.

"Utility Capital Expenditures Analysis: Net Present Value vs Revenue Requirements", annual meeting of Financial Management Assoc., Denver, Colorado, October 1985.

"Intervention Analysis and the Dynamics of Market Efficiency", annual meeting of Financial Management Assoc., San Francisco, Oct. 1982

"Intertemporal Market-Line Theory: An Empirical Study," annual meeting of Eastern Finance Assoc., Newport, R.I. 1981

"Option Writing for Financial Institutions: A Cost-Benefit Analysis", 1979 annual meeting Financial Research Foundation
"Free-lunch on the Toronto Stock Exchange", annual meeting of Financial Research Foundation of Canada, 1978.

"Simulation System Computer Software SIMFIN", HP International Business Computer Users Group, London, 1975.

"Inflation Accounting: Implications for Financial Analysis." Institute of Certified Public Accountants Symposium, 1979.

OFFICES IN PROFESSIONAL ASSOCIATIONS

- President, International Hewlett-Packard Business Computers Users Group, 1977

- Chairman Program Committee, International HP Business Computers Users Group, London, England, 1975

- Program Coordinator, Canadian Assoc. of Administrative Sciences, 1976

- Member, New Product Development Committee, Financial Management Association, 1985-1986

- Reviewer: Journal of Financial Research

  Financial Management

  Financial Review

  Journal of Finance

PUBLICATIONS

"Risk Aversion Revisited", Journal of Finance, Sept. 1983

"Hedging Regulatory Lag with Financial Futures," Journal of Finance, May 1983. (with G. Gay, R. Kolb)

"The Effect of CWIP on Cost of Capital, " Public Utilities Fortnightly, July 1986.

"The Effect of CWIP on Revenue Requirements" Public Utilities Fortnightly, August 1986.

"Intervention Analysis and the Dynamics of Market Efficiency," Time-Series Applications, (New York: North Holland, 1983. (with K. El-Sheshai)

"Market-Line Theory and the Canadian Equity Market," Journal of Business Administration, Jan. 1982, M. Brennan, editor

"Efficiency of Canadian Equity Markets," International Management Review, Feb. 1978

"Intertemporal Market-Line Theory: An Empirical Test," Financial Review, Proceedings of the Eastern Finance Association, 1981

BOOKS

Utilities' Cost of Capital, Public Utilities Reports Inc., Arlington, Va., 1984.

Regulatory Finance, Public Utilities Reports Inc., Arlington, Va., 1994

Driving Shareholder Value, McGraw-Hill, January 2001

MONOGRAPHS

Determining Cost of Capital for Regulated Industries, Public Utilities Reports, Inc., and The Management Exchange Inc., 1982 - 1993. (with V.L. Andrews)

Alternative Regulatory Frameworks, Public Utilities Reports, Inc., and The Management Exchange Inc., 1993. (with V.L. Andrews)

Risk and Return in Capital Projects, The Management Exchange Inc., 1980, (with B. Deschamps)

Utility Capital Expenditure Analysis, The Management Exchange Inc., 1983.

Regulation of Cable Television: An Econometric Planning Model, Quebec Department of Communications, 1978.

An Economic & Financial Profile of the Canadian Cablevision Industry. Canadian Radio-Television & Telecomm. Commission (CRTC), 1978

Computer Users' Manual: Finance and Investment Programs, University of Montreal Press, 1974, revised 1978.

Fiber Optics Communications: Economic Characteristics, Quebec Department of Communications, 1978.

"Canadian Equity Market Inefficiencies", Capital Market Research Memorandum, Garmaise & Thomson Investment Consultants, 1979.

MISCELLANEOUS CONSULTING REPORTS

''Operational Risk Analysis: California Water Utilities, Calif. Water Association, 1993.

"Cost of Capital Methodologies for Independent Telephone Systems", Ontario Telephone Service Commission, March 1989.

"The Effect of CWIP on Cost of Capital and Revenue Requirements", Georgia Power Company,1985.

"Costing Methodology and the Effect of Alternate Depreciation and Costing Methods on Revenue Requirements and Utility Finances", Gaz Metropolitan Inc., 1985.

"Simulated Capital Structure of CN-CP Telecommunications: A Critique", CRTC, 1977.

"Telecommunications Cost Inquiry: Critique",CRTC,1977.

"Social Rate of Discount in the Public Sector", CRTC Policy Statement 1974.

"Technical Problems in Capital Projects Analysis", CRTC Policy Statement, 1974.

RESEARCH GRANTS

"Econometric Planning Model of the Cablevision Industry", International Institute of Quantitative Economics, CRTC

"Application of the Averch-Johnson Model to Telecommunications Utilities", Canadian Radio-Television Commission (CRTC)

"Economics of the Fiber Optics Industry", Quebec Dept. of Communications

"Intervention Analysis and the Dynamics of Market Efficiency", Georgia State Univ. College of Business, 1981

"Firm Size and Beta Stability", Georgia State University College of Business, 1982

"Risk Aversion and the Demand for Risky Assets", Georgia State University College of Business, 1981.

Chase Econometrics, Interactive Data Corp., Research Grant, $50,000 per annum, 1986-1989.

UNIVERSITY SERVICE

- University Senate, elected departmental senator 1987-1989, 1998-2000
- Faculty Affairs Committee, elected departmental representative
- Professional Continuing Education Committee member
- Director Master in Science (Finance) Program
- Course Coordinator, Corporate Finance, MBA program
- Chairman, Corporate Finance Curriculum Committee
- Executive Education: Departmental Coordinator 2000
- University Senate Committee on Commencement
- University Senate Committee on Information Technology
- University Senate Committee on Student Discipline

MOODY'S ELECTRIC UTILITY COMMON STOCKS
OVER LONG-TERM TREASURY BONDS
ANNUAL LONG-TERM RISK PREMIUM ANALYSIS

Year	Long-Term Government Bond Yield	20 year Maturity Bond Value	Gain/Loss	Interest	Bond Total Return	Moody's Electric Utility Stock Index	Dividend	Capital Gain/(Loss) % Growth	Yield	Stock Total Return	Equity Risk Premium
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1931	4.07%	1,000.00				43.23					
1932	3.15%	1,135.75	135.75	40.70	17.64%	39.42	2.63	-8.81%	6.08%	-2.73%	-20.37%
1933	3.36%	969.60	(30.40)	31.50	0.11%	28.73	1.95	-27.12%	4.95%	-22.17%	-22.28%
1934	2.93%	1,064.73	64.73	33.60	9.83%	21.06	1.60	-26.70%	5.57%	-21.13%	-30.96%
1935	2.76%	1,025.99	25.99	29.30	5.53%	36.06	1.32	71.23%	6.27%	77.49%	71.96%
1936	2.55%	1,032.74	32.74	27.60	6.03%	41.60	1.48	15.36%	4.10%	19.47%	13.43%
1937	2.73%	972.40	(27.60)	25.50	-0.21%	24.24	1.74	-41.73%	4.18%	-37.55%	-37.34%
1938	2.52%	1,032.83	32.83	27.30	6.01%	27.55	1.50	13.66%	6.19%	19.84%	13.83%
1939	2.26%	1,041.65	41.65	25.20	6.68%	28.85	1.48	4.72%	5.37%	10.09%	3.41%
1940	1.94%	1,052.84	52.84	22.60	7.54%	22.22	1.54	-22.98%	5.34%	-17.64%	-25.19%
1941	2.04%	983.64	(16.36)	19.40	0.30%	13.45	1.44	-39.47%	6.48%	-32.99%	-33.29%
1942	2.46%	933.97	(66.03)	20.40	-4.56%	14.29	1.26	6.25%	9.37%	15.61%	20.18%
1943	2.48%	996.86	(3.14)	24.60	2.15%	21.01	1.28	47.03%	8.96%	55.98%	53.84%
1944	2.46%	1,003.14	3.14	24.80	2.79%	21.09	1.31	0.38%	6.24%	6.62%	3.82%
1945	1.99%	1,077.23	77.23	24.60	10.18%	31.14	1.30	47.65%	6.16%	53.82%	43.63%
1946	2.12%	978.90	(21.10)	19.90	-0.12%	32.71	1.43	5.04%	4.59%	9.63%	9.75%
1947	2.43%	951.13	(48.87)	21.20	-2.77%	25.60	1.56	-21.74%	4.77%	-16.97%	-14.20%
1948	2.37%	1,009.51	9.51	24.30	3.38%	26.20	1.60	2.34%	6.25%	8.59%	5.21%
1949	2.09%	1,045.58	45.58	23.70	6.93%	30.57	1.66	16.68%	6.34%	23.02%	16.09%
1950	2.24%	975.93	(24.07)	20.90	-0.32%	30.81	1.76	0.79%	5.76%	6.54%	6.86%
1951	2.69%	930.75	(69.25)	22.40	-4.69%	33.85	1.88	9.87%	6.10%	15.97%	20.65%
1952	2.79%	984.75	(15.25)	26.90	1.17%	37.85	1.91	11.82%	5.64%	17.46%	16.29%
1953	2.74%	1,007.66	7.66	27.90	3.56%	39.61	2.01	4.65%	5.31%	9.96%	6.40%
1954	2.72%	1,003.07	3.07	27.40	3.05%	47.56	2.13	20.07%	5.38%	25.45%	22.40%
1955	2.95%	965.44	(34.56)	27.20	-0.74%	49.35	2.21	3.76%	4.65%	8.41%	9.15%
1956	3.45%	928.19	(71.81)	29.50	-4.23%	48.96	2.32	-0.79%	4.70%	3.91%	8.14%
1957	3.23%	1,032.23	32.23	34.50	6.67%	50.30	2.43	2.74%	4.96%	7.70%	1.03%
1958	3.82%	918.01	(81.99)	32.30	-4.97%	66.37	2.50	31.95%	4.97%	36.92%	41.89%
1959	4.47%	914.65	(85.35)	38.20	-4.71%	65.77	2.61	-0.90%	3.93%	3.03%	7.74%
1960	3.80%	1,093.27	93.27	44.70	13.80%	76.82	2.68	16.80%	4.07%	20.88%	7.08%
1961	4.15%	952.75	(47.25)	38.00	-0.92%	99.32	2.81	29.29%	3.66%	32.95%	33.87%
1962	3.95%	1,027.48	27.48	41.50	6.90%	96.49	2.97	-2.85%	2.99%	0.14%	-6.76%
1963	4.17%	970.35	(29.65)	39.50	0.99%	102.31	3.21	6.03%	3.33%	9.36%	8.37%
1964	4.23%	991.96	(8.04)	41.70	3.37%	115.54	3.43	12.93%	3.35%	16.28%	12.92%
1965	4.50%	964.64	(35.36)	42.30	0.69%	114.86	3.86	-0.59%	3.34%	2.75%	2.06%

MOODY'S ELECTRIC UTILITY COMMON STOCKS
OVER LONG-TERM TREASURY BONDS
ANNUAL LONG-TERM RISK PREMIUM ANALYSIS

Year	Long-Term Government Bond Yield	20 year Maturity Bond Value	Gain/Loss	Interest	Bond Total Return	Moody's Electric Utility Stock Index	Dividend	Capital Gain/(Loss) % Growth	Yield	Stock Total Return	Equity Risk Premium
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1966	4.55%	993.48	(6.52)	45.00	3.85%	105.99	4.11	-7.72%	3.58%	-4.14%	-7.99%
1967	5.56%	879.01	(120.99)	45.50	-7.55%	98.19	4.34	-7.36%	4.09%	-3.26%	4.29%
1968	5.98%	951.38	(48.62)	55.60	0.70%	104.04	4.50	5.96%	4.58%	10.54%	9.84%
1969	6.87%	904.00	(96.00)	59.80	-3.62%	84.62	4.61	-18.67%	4.43%	-14.23%	-10.62%
1970	6.48%	1,043.38	43.38	68.70	11.21%	88.59	4.70	4.69%	5.55%	10.25%	-0.96%
1971	5.97%	1,059.09	59.09	64.80	12.39%	85.56	4.77	-3.42%	5.38%	1.96%	-10.42%
1972	5.99%	997.69	(2.31)	59.70	5.74%	83.61	4.87	-2.28%	5.69%	3.41%	-2.33%
1973	7.26%	867.09	(132.91)	59.90	-7.30%	60.87	5.01	-27.20%	5.99%	-21.21%	-13.90%
1974	7.60%	965.33	(34.67)	72.60	3.79%	41.17	4.83	-32.36%	7.93%	-24.43%	-28.22%
1975	8.05%	955.63	(44.37)	76.00	3.16%	55.66	4.97	35.20%	12.07%	47.27%	44.10%
1976	7.21%	1,088.25	88.25	80.50	16.87%	66.29	5.18	19.10%	9.31%	28.40%	11.53%
1977	8.03%	919.03	(80.97)	72.10	-0.89%	68.19	5.54	2.87%	8.36%	11.22%	12.11%
1978	8.98%	912.47	(87.53)	80.30	-0.72%	59.75	5.81	-12.38%	8.52%	-3.86%	-3.13%
1979	10.12%	902.99	(97.01)	89.80	-0.72%	56.41	6.22	-5.59%	10.41%	4.82%	5.54%
1980	11.99%	859.23	(140.77)	101.20	-3.96%	54.42	6.58	-3.53%	11.66%	8.14%	12.09%
1981	13.34%	906.45	(93.55)	119.90	2.63%	57.20	6.99	5.11%	12.84%	17.95%	15.32%
1982	10.95%	1,192.38	192.38	133.40	32.58%	70.26	7.43	22.83%	12.99%	35.82%	3.24%
1983	11.97%	923.12	(76.88)	109.50	3.26%	72.03	7.87	2.52%	11.20%	13.72%	10.46%
1984	11.70%	1,020.70	20.70	119.70	14.04%	80.16	8.26	11.29%	11.47%	22.75%	8.71%
1985	9.56%	1,189.27	189.27	117.00	30.63%	94.98	8.61	18.49%	10.74%	29.23%	-1.40%
1986	7.89%	1,166.63	166.63	95.60	26.22%	113.66	8.89	19.67%	9.36%	29.03%	2.80%
1987	9.20%	881.17	(118.83)	78.90	-3.99%	94.24	9.12	-17.09%	8.02%	-9.06%	-5.07%
1988	9.18%	1,001.82	1.82	92.00	9.38%	100.94	8.87	7.11%	9.41%	16.52%	7.14%
1989	8.16%	1,099.75	99.75	91.80	19.16%	122.52	8.82	21.38%	8.74%	30.12%	10.96%
1990	8.44%	973.17	(26.83)	81.60	5.48%	117.77	8.79	-3.88%	7.17%	3.30%	-2.18%
1991	7.30%	1,118.94	118.94	84.40	20.33%	144.02	8.95	22.29%	7.60%	29.89%	9.55%
1992	7.26%	1,004.19	4.19	73.00	7.72%	141.06	9.05	-2.06%	6.28%	4.23%	-3.49%
1993	6.54%	1,079.70	79.70	72.60	15.23%	146.70	8.99	4.00%	6.37%	10.37%	-4.86%
1994	7.99%	856.40	(143.60)	65.40	-7.82%	115.50	8.96	-21.27%	6.11%	-15.16%	-7.34%
1995	6.03%	1,225.98	225.98	79.90	30.59%	142.90	9.06	23.72%	7.84%	31.57%	0.98%
1996	6.73%	923.67	(76.33)	60.30	-1.60%	136.00	9.06	-4.83%	6.34%	1.51%	3.11%
1997	6.02%	1,081.92	81.92	67.30	14.92%	155.73	9.06	14.51%	6.66%	21.17%	6.25%
1998	5.42%	1,072.71	72.71	60.20	13.29%	181.44	8.01	16.51%	5.14%	21.65%	8.36%
1999	6.00%	932.97	(67.03)	54.20	-1.28%	170.00	8.01	-6.31%	4.41%	-1.89%	-0.61%

MOODY'S ELECTRIC UTILITY COMMON STOCKS
OVER LONG-TERM TREASURY BONDS
ANNUAL LONG-TERM RISK PREMIUM ANALYSIS

Year	Long-Term Government Bond Yield	20 year Maturity Bond Value	Gain/Loss	Interest	Bond Total Return	Moody's Electric Utility Stock Index	Dividend	Capital Gain/(Loss) % Growth	Yield	Stock Total Return	Equity Risk Premium
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Mean											**5.20%**

Source:Moody's Public Utility Manual, December stock prices and dividends
Bond yields from Ibbotson Assciates Table A-9 Long-Term Government Bonds Yields
December each year.

**MOODY'S NATURAL GAS DISTRIBUTION COMMON STOCKS
OVER LONG-TERM TREASURY BONDS
ANNUAL LONG-TERM RISK PREMIUM ANALYSIS**

Year	Long-Term Government Bond Yield (1)	20 year Maturity Bond Value (2)	Gain/Loss (3)	Interest (4)	Bond Total Return (5)	Moody's Natural Gas Distribution Stock Index (6)	Dividend (7)	Capital Gain/(Loss) % Growth (8)	Yield (9)	Stock Total Return (10)	Equity Risk Premium (11)
1954	2 72%	1,000.00				26.47					
1955	2.95%	965.44	(34.56)	27.20	-0.74%	28.10	1.38	6.16%	5.21%	11.37%	12.11%
1956	3.45%	928.19	(71.81)	29.50	-4.23%	28.23	1.48	0.46%	5.27%	5.73%	9.96%
1957	3.23%	1,032.23	32.23	34.50	6.67%	25.78	1 49	-8.68%	5.28%	-3.40%	-10.07%
1958	3.82%	918.01	(81.99)	32.30	-4.97%	38.71	1 57	50.16%	6.09%	56.25%	61.21%
1959	4.47%	914.65	(85.35)	38.20	-4.71%	39.59	1.66	2.27%	4.29%	6.56%	11.28%
1960	3.80%	1,093.27	93 27	44.70	13.80%	48.21	1 84	21.77%	4.65%	26.42%	12.62%
1961	4.15%	952.75	(47.25)	38.00	-0.92%	64.96	1 94	34.74%	4 02%	38.77%	39.69%
1962	3.95%	1,027.48	27.48	41.50	6.90%	59.73	2 02	-8.05%	3.11%	-4.94%	-11.84%
1963	4.17%	970.35	(29.65)	39.50	0.99%	64.62	2.18	8 19%	3.65%	11.84%	10 85%
1964	4.23%	991.96	(8.04)	41.70	3.37%	68.24	2 30	5.60%	3.56%	9.16%	5.80%
1965	4.50%	964.64	(35.36)	42.30	0.69%	64 31	2.48	-5.76%	3.63%	-2.12%	-2.82%
1966	4.55%	993.48	(6.52)	45.00	3.85%	53.50	2.61	-16.81%	4.06%	-12.75%	-16.60%
1967	5.56%	879.01	(120.99)	45.50	-7.55%	50.49	2.74	-5.63%	5.12%	-0.50%	7.04%
1968	5.98%	951.38	(48.62)	55.60	0.70%	53.80	2.81	6.56%	5.57%	12.12%	11.42%
1969	6.87%	904.00	(96.00)	59.80	-3.62%	43.88	2.93	-18.44%	5.45%	-12.99%	-9.37%
1970	6.48%	1,043.38	43.38	68.70	11.21%	52.33	3.01	19.26%	6 86%	26.12%	14.91%
1971	5.97%	1,059.09	59.09	64.80	12.39%	47.86	3 07	-8.54%	5.87%	-2.68%	-15.06%
1972	5.99%	997.69	(2.31)	59.70	5.74%	53.54	3.12	11.87%	6.52%	18.39%	12.65%
1973	7.26%	867.09	(132.91)	59.90	-7.30%	43.43	3.28	-18 88%	6.13%	-12.76%	-5.46%
1974	7.60%	965.33	(34.67)	72.60	3.79%	29.71	3 34	-31.59%	7.69%	-23.90%	-27.69%
1975	8.05%	955.63	(44.37)	76.00	3.16%	38.29	3.48	28.88%	11.71%	40.59%	37.43%
1976	7.21%	1,088.25	88.25	80.50	16.87%	51.80	3.70	35.28%	9 66%	44.95%	28.07%
1977	8.03%	919.03	(80.97)	72.10	-0.89%	50.88	3.93	-1.78%	7.59%	5.81%	6.70%
1978	8.98%	912.47	(87.53)	80.30	-0.72%	45 97	4.18	-9.65%	8.22%	-1.43%	-0.71%
1979	10.12%	902.99	(97.01)	89.80	-0.72%	53.50	4.44	16.38%	9.66%	26.04%	26.76%
1980	11 99%	859.23	(140.77)	101.20	-3.96%	56.61	4.68	5.81%	8.75%	14.56%	18.52%
1981	13.34%	906.45	(93.55)	119.90	2.63%	53.50	5.12	-5.49%	9.04%	3.55%	0.92%
1982	10.95%	1,192.38	192.38	133.40	32.58%	50.62	5.39	-5.38%	10.07%	4.69%	-27 89%
1983	11.97%	923.12	(76.88)	109.50	3.26%	55.79	5.55	10.21%	10.96%	21.18%	17.92%
1984	11.70%	1,020.70	20.70	119.70	14.04%	69.70	5.88	24.93%	10.54%	35.47%	21.43%
1985	9.56%	1,189.27	189.27	117.00	30.63%	76.58	6.22	9.87%	8.92%	18.79%	-11.83%
1986	7.89%	1,166.63	166.63	95.60	26.22%	90.89	5.71	18.69%	7.46%	26.14%	-0.08%
1987	9.20%	881.17	(118.83)	78.90	-3.99%	77.25	6.02	-15.01%	6.62%	-8.38%	-4.39%
1988	9.18%	1,001.82	1.82	92.00	9.38%	86.76	6.30	12.31%	8.16%	20.47%	11.08%
1989	8.16%	1,099.75	99.75	91.80	19.16%	117 05	6.58	34.91%	7.58%	42.50%	23.34%
1990	8.44%	973.17	(26.83)	81.60	5.48%	108.86	6.84	-7.00%	5.84%	-1.15%	-6 63%
1991	7.30%	1,118.94	118.94	84.40	20.33%	124.32	6.99	14.20%	6.42%	20.62%	0.29%
1992	7 26%	1,004.19	4.19	73.00	7.72%	138.79	7.14	11.64%	5.74%	17.38%	9.66%
1993	6 54%	1,079.70	79.70	72.60	15.23%	154.06	7.30	11.00%	5.26%	16.26%	1.03%
1994	7.99%	856.40	(143.60)	65.40	-7.82%	126.96	7.44	-17.59%	4.83%	-12.76%	-4.94%
1995	6.03%	1,225.98	225.98	79.90	30.59%	155.94	7.56	22.83%	5 95%	28.78%	-1.81%
1996	6 73%	923.67	(76.33)	60.30	-1.60%	166.64	7.91	6.86%	5.07%	11.93%	13.54%
1997	6.02%	1,081.92	81.92	67.30	14.92%	191.04	8.02	14.64%	4.81%	19.46%	4.53%
1998	5.42%	1,072.71	72.71	60.20	13.29%	177.24	8.13	-7 22%	4.26%	-2.97%	-16.26%
1999	6 82%	848.41	(151.59)	54.20	-9.74%	160.00	8 16	-9.73%	4.60%	-5.12%	4 62%
MEAN					**6.05%**					**11.87%**	**5.82%**

Source: Moody's Public Utility Manual 1999 December stock prices and dividends
Bond yields from Ibbotson Assciates Table A-9 Long-Term Government Bonds Yields
December each year.

VALUE LINE WATER UTILITIES
DCF ANALYSIS: ANALYSTS' GROWTH FORECASTS

Company	Industry (1)	Beta (2)	% Current Divid Yield (3)	Analysts Growth Forecast (4)	Expected Divid Yield (5)	Cost of Equity (6)	ROE (6)
1 Amer. Water Works	WATER	0.55	3.0	6.0	3.5	9.5	9.7
2 Phila. Suburban	WATER	0.60	2.7	8.6	3.2	11.8	12.0
3 California Water	WATER	0.65	4.1	6.0	4.7	10.7	10.9
4 Amer. States Water	WATER	0.65	4.1	4.5	4.5	9.0	9.3
5 SJW Corp.	WATER	0.50					
6 Conn. Water Services	WATER	0.50	3.6	3.0	4.0	7.0	7.3
7 Middlesex Water	WATER	0.40	4.1	3.0	4.5	7.5	7.8
8 Southwest Water	WATER	0.50					
9 Artesian Res Corp	WATER	0.45	4.4	8.0	5.1	13.1	13.3
AVERAGE		**0.53**	**3.7**	**5.6**	**4.2**	**9.8**	**10.0**

Notes:
Column 1, 2, 3: Value Line Investment Survey for Windows, 4/2001
Column 4: IBES long-term earnings growth forecast, 4/2001
Column 5 = Column 3 times (1 + Column 4/100) + 0.003% for quarterly timing of dividends
Column 6 = Column 5 + Column 4
Column 7 = (Column 5 /0.95) + Column 4

VALUE LINE WATER UTILITIES
DCF ANALYSIS: VALUE LINE GROWTH FORECASTS

Company	Industry (1)	Beta (2)	% Current Divid Yield (3)	Analysts Growth Forecast (4)	Expected Divid Yield (5)	Cost of Equity (6)	ROE (6)
1 Amer. Water Works	WATER	0.55	3.0	6.0	3.5	9.5	9.7
2 Phila. Suburban	WATER	0.60	2.7	8.6	3.2	11.8	12.0
3 California Water	WATER	0.65	4.1	6.0	4.7	10.7	10.9
4 Amer. States Water	WATER	0.65	4.1	4.5	4.5	9.0	9.3
5 SJW Corp.	WATER	0.50					
6 Conn. Water Services	WATER	0.50	3.6	3.0	4.0	7.0	7.3
7 Middlesex Water	WATER	0.40	4.1	3.0	4.5	7.5	7.8
8 Southwest Water	WATER	0.50					
9 Artesian Res Corp	WATER	0.45	4.4	8.0	5.1	13.1	13.3
AVERAGE		**0.53**	**3.7**	**5.6**	**4.2**	**9.8**	**10.0**

Notes:
Column 1, 2, 3, 4: Value Line Investment Survey for Windows, 4/2001
Column 5 = Column 3 times (1 + Column 4/100)
Column 6 = Column 5 + Column 4
Column 7 = (Column 5 /0.95) + Column 4

VALUE LINE WATER UTILITIES
DCF ANALYSIS: HISTORICAL GROWTH

Company	Industry (1)	Beta (2)	% Current Divid Yield (3)	Value Line Historical Growth (4)	Expected Divid Yield (5)	Cost of Equity (6)	ROE (6)
1 Amer. Water Works	WATER	0.55	3.0	6.5	3.5	10.0	10.2
2 Phila. Suburban	WATER	0.60	2.7	10.0	3.2	13.2	13.4
3 California Water	WATER	0.65	4.1	5.5	4.6	10.1	10.4
4 Amer. States Water	WATER	0.65	4.1	0.5	4.4	4.9	5.1
5 SJW Corp.	WATER	0.50	3.1	7.0	3.6	10.6	10.8
6 Conn. Water Services	WATER	0.50	3.6	3.0	4.0	7.0	7.3
7 Middlesex Water	WATER	0.40	4.1	2.0	4.5	6.5	6.7
8 Southwest Water	WATER	0.50	1.9	16.5	2.5	19.0	19.1
9 Artesian Res Corp	WATER	0.45					
AVERAGE		**0.53**	**3.3**	**6.4**	**3.8**	**10.2**	**10.4**

Notes:
Column 1, 2, 3, 4: Value Line Investment Survey for Windows, 4/2001
Column 5 = Column 3 times (1 + Column 4/100) + 0.003% for quarterly timing of dividends
Column 6 = Column 5 + Column 4
Column 7 = (Column 5 /0.95) + Column 4

MOODY'S GENERATION DIVESTITURE UTILITIES
DCF ANALYSIS: ANALYSTS' GROWTH FORECASTS

	Company	% Current Divid Yield (1)	Analysts' Growth Forecast (2)	% Expected Divid Yield (3)	Cost of Equity (4)	ROE (5)
1	Allegheny Energy	3.7	8.4	4.0	12.4	12.6
2	Ameren Corp.	6.1	3.5	6.3	9.8	10.1
3	Conectiv	4.0	5.1	4.2	9.4	9.6
4	Consol. Edison	5.8	7.3	6.2	13.5	13.8
5	DQE	5.9	6.8	6.3	13.1	13.4
6	Edison Int'l					
7	Energy East Corp.	5.0	9.3	5.5	14.7	15.0
8	GPU Inc.	6.8	6.4	7.2	13.7	14.0
9	NSTAR	5.3	11.9	5.9	17.9	18.2
10	Niagara Mohawk					
11	Northeast Utilities	2.3	10.2	2.5	12.7	12.8
12	PG&E Corp.					
13	Sempra Energy	4.3	7.8	4.6	12.5	12.7
14	Sierra Pacific Res.	7.3	5.3	7.7	13.0	13.4
15	UIL Holdings	5.8	3.7	6.0	9.7	10.0
	AVERAGE	**5.2**	**7.1**	**5.5**	**12.7**	**13.0**
	TRUNCATED AVERAGE					**12.8**

Notes:
Column 1: Value Line Investment Survey for Windows, 4/2001
Column 2: IBES long-term earnings growth forecast, 4/2001;
shaded cell: if IBES growth unavailable, Value Line projected growth.
Column 3 = Column 1 times (1 + Column 2/100)
Column 4 = Column 3 + Column 2
Column 5 = (Column 3 /0.95) + Column 2

MOODY'S GENERATION DIVESTITURE UTILITIES
DCF ANALYSIS: VALUE LINE GROWTH PROJECTIONS

	Company	% Current Divid Yield (1)	Proj EPS Growth (2)	% Expected Divid Yield (3)	Cost of Equity (4)	ROE (5)
1	Allegheny Energy	3.7	10.0	4.0	14.0	14.3
2	Ameren Corp.	6.1	5.5	6.4	11.9	12.3
3	Conectiv	4.0	9.5	4.4	13.9	14.2
4	Consol. Edison	5.8	2.0	5.9	7.9	8.2
5	DQE	5.9	5.5	6.3	11.8	12.1
6	Edison Int'l					
7	Energy East Corp.	5.0	8.5	5.4	13.9	14.2
8	GPU Inc.					
9	NSTAR	5.3	6.5	5.6	12.1	12.4
10	Niagara Mohawk					
11	Northeast Utilities					
12	PG&E Corp.					
13	Sempra Energy	4.3	8.5	4.7	13.2	13.4
14	Sierra Pacific Res.	7.3	6.5	7.8	14.3	14.7
15	UIL Holdings	5.8	5.0	6.1	11.1	11.4
	AVERAGE	**5.3**	**6.8**	**5.7**	**12.4**	**12.7**
	TRUNCATED AVERAGE					**13.0**

Notes:
Column 1, 2: Value Line Investment Survey for Windows, 4/2001
Column 3 = Column 1 times (1 + Column 2/100)
Column 4 = Column 3 + Column 2
Column 5 = (Column 3 /0.95) + Column 2

NATURAL GAS DISTRIBUTION UTILITIES
DCF ANALYSIS: ANALYSTS' GROWTH FORECASTS

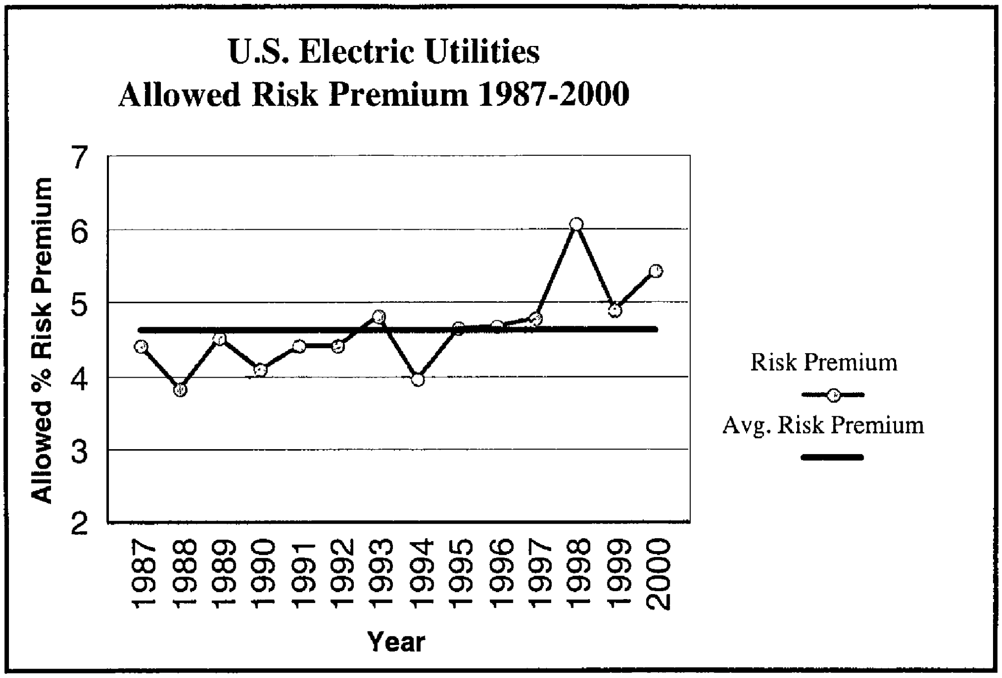
	Company	Industry	Beta	% Current Divid Yield	Analysts Growth Forecast	Expected Divid Yield	Cost of Equity	ROE
		(1)	(2)	(3)	(4)	(5)	(6)	(6)
1	AGL Resources	GASDISTR	0.60	5.0	5.5	5.2	10.7	11.0
2	Atmos Energy	GASDISTR	0.55	5.5	7.1	5.8	12.9	13.2
3	Energen Corp.	GASDISTR	0.75	2.0	11.8	2.3	14.0	14.1
4	KeySpan Corp.	GASDISTR	0.60	4.5	9.6	4.9	14.6	14.8
5	MCN Energy Group	GASDISTR	0.90	3.9	6.0	4.1	10.2	10.4
6	NICOR Inc.	GASDISTR	0.60	4.8	6.1	5.1	11.2	11.5
7	New Jersey Resources	GASDISTR	0.55	4.3	6.8	4.6	11.4	11.7
8	Northwest Nat. Gas	GASDISTR	0.60	5.3	4.3	5.5	9.8	10.1
9	ONEOK Inc.	GASDISTR	0.70	3.1	7.7	3.4	11.0	11.2
10	Peoples Energy	GASDISTR	0.70	5.2	6.3	5.5	11.7	12.0
11	Piedmont Natural Gas	GASDISTR	0.60	4.4	5.4	4.6	10.1	10.3
12	Southwest Gas	GASDISTR	0.65	4.0	4.8	4.2	8.9	9.1
13	UGI Corp.	GASDISTR	0.70	6.4	6.0	6.8	12.8	13.2
14	WGL Holdings Inc.	GASDISTR	0.60	4.6	4.4	4.8	9.2	9.5
	AVERAGE		**0.65**	**4.5**	**6.6**	**4.8**	**11.3**	**11.6**
	TRUNCATED AVERAGE							**11.5**

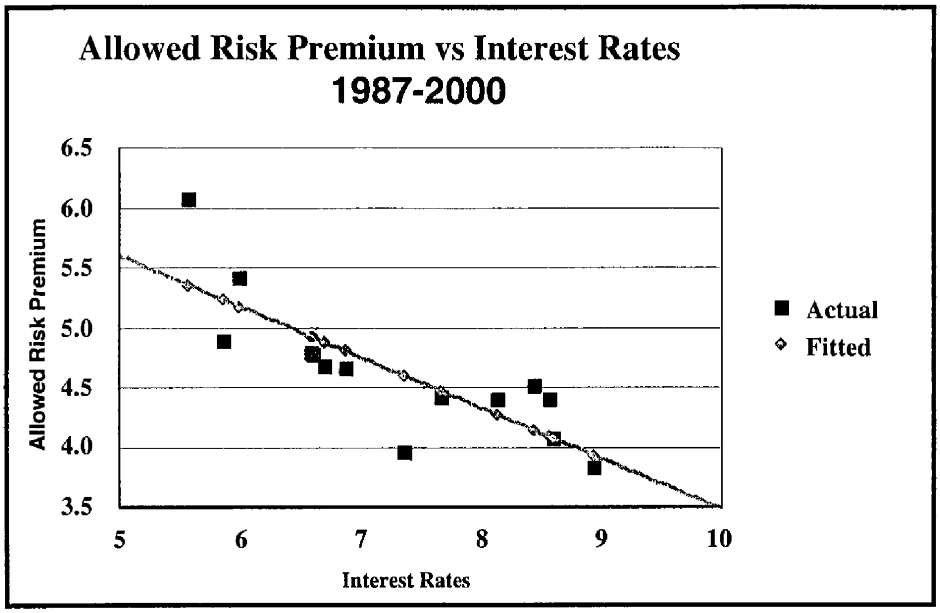
Notes:
Column 1, 2, 3: Value Line Investment Survey for Windows, 4/2001
Column 4: IBES long-term earnings growth forecast, 4/2001
Column 5 = Column 3 times (1 + Column 4/100)
Column 6 = Column 5 + Column 4
Column 7 = (Column 5 /0.95) + Column 4

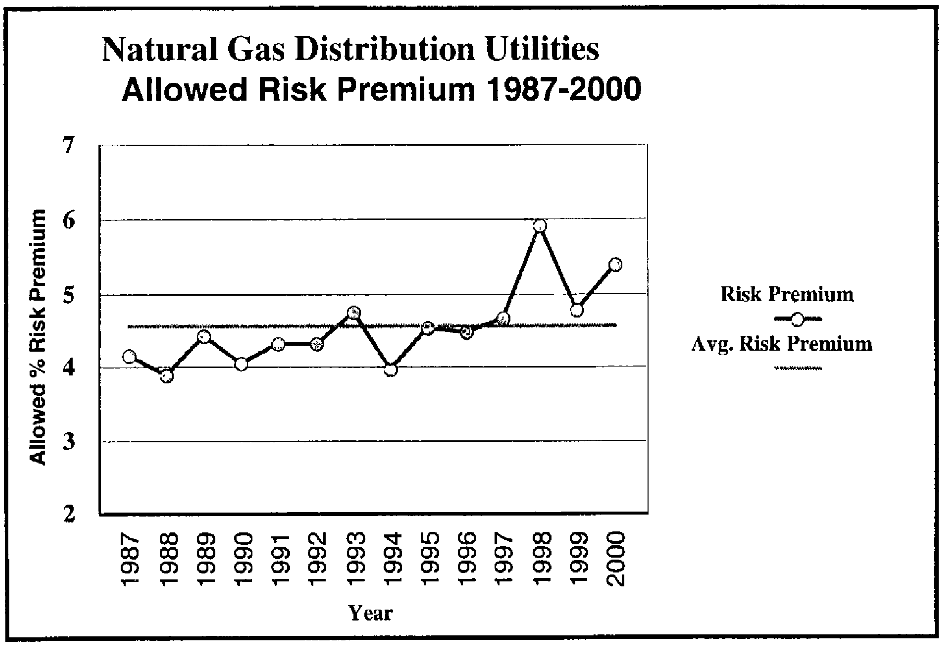
NATURAL GAS DISTRIBUTION UTILITIES
DCF ANALYSIS: VALUE LINE GROWTH FORECASTS

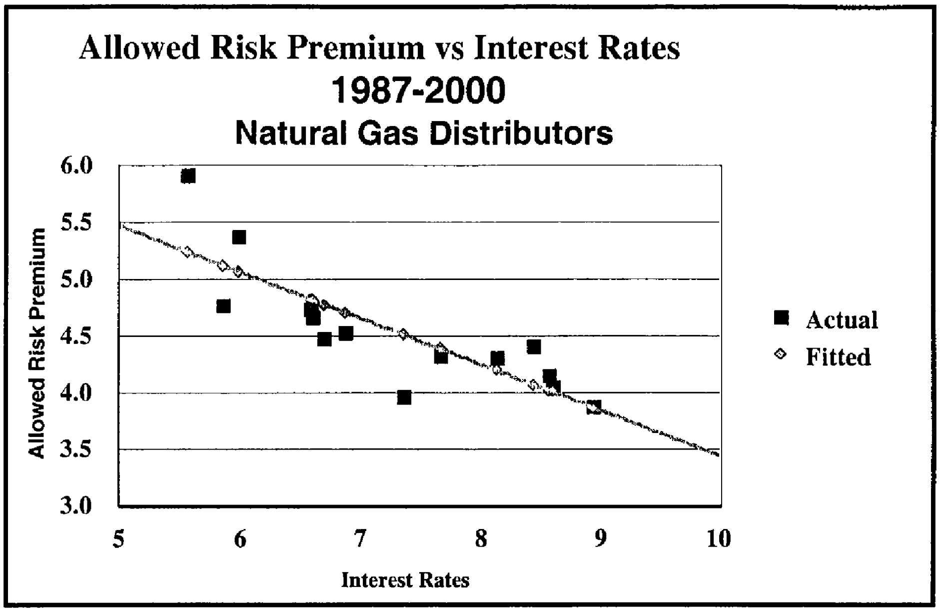
	Company	Industry (1)	Beta (2)	% Current Divid Yield (3)	Value Line Proj Growth (4)	Expected Divid Yield (5)	Cost of Equity (6)	ROE (6)
1	AGL Resources	GASDISTR	0.60	5.0	6.0	5.3	11.3	11.5
2	Atmos Energy	GASDISTR	0.55	5.5	13.5	6.2	19.7	20.0
3	Energen Corp.	GASDISTR	0.75	2.0	13.5	2.3	15.8	15.9
4	KeySpan Corp.	GASDISTR	0.60	4.5	23.5	5.5	29.0	29.3
5	MCN Energy Group	GASDISTR	0.90	3.9	6.0	4.1	10.1	10.3
6	NICOR Inc.	GASDISTR	0.60	4.8	6.5	5.1	11.6	11.9
7	New Jersey Resources	GASDISTR	0.55	4.3	7.5	4.6	12.1	12.4
8	Northwest Nat. Gas	GASDISTR	0.60	5.3	7.5	5.7	13.2	13.5
9	ONEOK Inc.	GASDISTR	0.70	3.1	12.0	3.5	15.5	15.7
10	Peoples Energy	GASDISTR	0.70	5.2	8.5	5.6	14.1	14.4
11	Piedmont Natural Gas	GASDISTR	0.60	4.4	8.0	4.8	12.8	13.0
12	Southwest Gas	GASDISTR	0.65	4.0	5.0	4.2	9.2	9.4
13	UGI Corp.	GASDISTR	0.70	6.4	10.5	7.1	17.6	18.0
14	WGL Holdings Inc.	GASDISTR	0.60	4.6	8.5	5.0	13.5	13.8
	AVERAGE		**0.65**	**4.5**	**9.8**	**4.9**	**14.7**	**14.9**
	TRUNCATED AVERAGE							**14.2**

Notes:
Column 1, 2, 3, 4: Value Line Investment Survey for Windows, 4/2001
Column 5 = Column 3 times (1 + Column 4/100)
Column 6 = Column 5 + Column 4
Column 7 = (Column 5 /0.95) + Column 4
Shaded cell: Value Line forecast unavailable; used IBES forecast


U.S. Electric Utilities
Allowed Risk Premium 1987-2000
Allowed % Risk Premium
7
6
5
4
3
2
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Risk Premium
Avg. Risk Premium


Allowed Risk Premium vs Interest Rates
1987-2000
Allowed Risk Premium
6.5
6.0
5.5
5.0
4.5
4.0
3.5
5
6
7
8
9
10
Interest Rates
Actual
Fitted


Natural Gas Distribution Utilities
Allowed Risk Premium 1987-2000
Allowed % Risk Premium
7
6
5
4
3
2
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
Risk Premium
Avg. Risk Premium


Allowed Risk Premium vs Interest Rates
1987-2000
Natural Gas Distributors
Allowed Risk Premium
6.0
5.5
5.0
4.5
4.0
3.5
3.0
5
6
7
8
9
10
Interest Rates
Actual
Fitted