PRE-FILED DIRECT TESTIMONY

OF

PAUL R. MOUL

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GLOSSARY ACRONYMS AND DEFINED TERMS	
ACRONYM	**DEFINED TERM**
AFUDC	Allowance for Funds Used During Construction
β	Beta
b	represents the retention rate that consists of the fraction of earnings that are not paid out as dividends
b x r	Represents internal growth
CAPM	Capital Asset Pricing Model
CCR	Corporate Credit Rating
CE	Comparable Earnings
DCF	Discounted Cash Flow
FERC	Federal Energy Regulatory Commission
FFO	Funds from Operations
FOMC	Federal Open Market Committee
g	Growth rate
GCR	Gas Cost Rate
IGF	Internally Generated Funds
LDC	Local Distribution Companies
Lev	Leverage modification
LT	Long Term
M&A	Merger and Acquisition
MLP	Master Limited Partnerships
PUHCA	Public Utility Holding Company Act
r	represents the expected rate of return on common equity
Rf	Risk-free rate of return
Rm	Market risk premium
RP	Risk Premium
s	Represents the new common shares expected to be issued by a firm
s x v	Represents external growth
S&P	Standard & Poor's
v	Represents the value that accrues to existing shareholders from selling stock at a price different from book value

I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

Q. PLEASE STATE YOUR NAME, OCCUPATION AND BUSINESS ADDRESS.

A. My name is Paul Ronald Moul. My business address is 251 Hopkins Road, Haddonfield, New Jersey 08033-3062. I am Managing Consultant of the firm P. Moul & Associates, an independent financial and regulatory consulting firm. My educational background, business experience and qualifications are provided in Attachment NG-PRM-1, which follows my direct testimony.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. My testimony presents data, analysis, and a recommendation concerning the appropriate rate of return that should be used in the determination of the revenue requirement for National Grid's gas operations in Rhode Island, ("National Grid" or the "Company"). Additional evidence is contained in Attachments NG-PRM-2 through NG-PRM-10, which follows my direct testimony. The items covered in these attachments provide additional detailed information concerning the explanation and application of the various financial models upon which I rely. My analysis and recommendation are supported by the detailed financial data contained in Attachments NG-PRM-11 through Attachment NG-PRM-22.

Q. BASED UPON YOUR ANALYSIS, WHAT IS YOUR CONCLUSION CONCERNING THE APPROPRIATE RATE OF RETURN FOR THE COMPANY IN THIS CASE?

A. My conclusion is that the Company should be afforded an opportunity to earn a 9.27% rate of return, which includes a rate of return on common equity of 11.50%. The rate of return that I propose in this case is shown on Attachment NG-PRM-11 and is based on capital structure ratios that reflect both company specific and gas industry data.

Q. WHY IS IT NECESSARY TO FOLLOW THIS PROCEDURE TO DEVELOP THE RATE OF RETURN FOR THE COMPANY?

A. New England Gas Company was a division of Southern Union Company who had acquired Providence Gas Company, Valley Gas Company, and the Bristol & Warren Gas Company through the purchase of their respective parent companies. After the creation of New England Gas Company by Southern Union, the capital structure of the Company became unidentifiable. The New England Gas Company assets in Rhode Island were subsequently purchased by National Grid, which is now part of The Narragansett Electric Company, d/b/a National Grid. So today, as in the recent past, the Company does not have an identifiable capital structure.

Q. HOW THEN DO YOU APPROACH THE ISSUE OF CAPITAL STRUCTURE FOR THE COMPANY?

A. I used a five step procedure to develop capital structure ratios for this case. In step

one, I identified the major regulatory capital components of the Company. These components are shown on the lower panel of data on Attachment NG-PRM-11 and consist of the Company's rate base, gas in storage, working capital associated with gas purchases, and hazardous waste reserve. These elements represent common components of the assets of a local distribution company ("LDC") that would require financing with investor provided capital.

In step two, I identified the average balance of short-term debt. Short-term debt for a LDC serves several purposes. Aside from financing construction work in progress, short-term debt is also used by an LDC to provide seasonal working capital needs related to stored gas inventory that accumulates during the summer and early fall prior to the send out to customers in the heating session. It is also used to finance customer accounts receivable during the heating season until those receivables are converted to cash. The cycle then repeats. Another use of short-term debt by some natural gas utilities relates to the financing of regulatory assets, such as under-recovered purchased gas costs, deferred environmental remediation costs, and other transitional costs incurred but not yet paid by customers. As such, the Company's average balance of short-term debt was the first amount assigned to the regulatory capital components, which include gas in storage, working capital associated with gas purchases, and the deferred cost of environmental remediation (referred to on Attachment NG-PRM-11 as the hazardous waste reserve).

In step three, I calculated the remaining regulatory capital that would require

permanent capital provided by investors. This amount remains after accounting for all of the Company's average short-term debt as explained above.

In step four, I apportioned the remaining regulatory capital that was calculated in step three with capital structure ratios of 46% long-term debt and 54% equity, which are the ratios of my Gas Group that I will discuss later in my testimony. I further confirmed the reasonableness of those ratios by reference to the forecast common equity ratios published by Value Line.

Finally in step five, I calculated capital structure ratios of 40.63% ($124.0 million ÷ $305.2 million) long-term debt, 11.66% ($35.6 million ÷ $305.2 million) short-term debt, and 47.71% ($145.6 million ÷ $305.2 million) common equity for the Company. With these ratios, I calculated the weighted average cost of capital using the cost of long- and short-term debt supplied to me by the Company and the 11.50% rate of return on common equity that I established independently. The resulting 9.27% rate of return will provide a compensatory level of return for the use of capital and provide the Company with the ability to attract capital on reasonable terms.

Q. PLEASE PROVIDE AN OVERVIEW OF THE COMPANY.

A. The Company provides natural gas distribution service to approximately 245,000 customers located in Rhode Island. In 2007, approximately 50% of throughput was to residential customers, approximately 17% of throughput was to commercial customers, and approximately 33% of throughput was to industrial, large volume,

interruptible and transportation customers. National Grid obtains its gas supplies from producers and marketers and has transportation arrangements through connections with two interstate pipelines. The Company has arrangements for underground storage of natural gas and owns liquefied natural gas and propane facilities to supplement flowing gas.

Q. HOW HAVE YOU DETERMINED THE COST OF COMMON EQUITY IN THIS CASE?

A. The cost of common equity is established using capital market and financial data relied upon by investors to assess the relative risk, and hence the cost of equity, for a natural gas utility, such as National Grid. In this regard, I relied on four (4) well-recognized measures of the cost of equity: the Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") analysis, the Capital Asset Pricing Model ("CAPM"), and the Comparable Earnings ("CE") approach.

Q. IN YOUR OPINION, WHAT FACTORS SHOULD THE COMMISSION CONSIDER WHEN DETERMINING THE COMPANY'S COST OF CAPITAL IN THIS PROCEEDING?

A. The Commission should consider the ratesetting principles that I have set forth in Attachment NG-PRM-2. In this regard, the Commission's rate of return allowance must be set to cover the Company's interest and dividend payments, provide a reasonable level of earnings retention, produce an adequate level of internally generated funds to meet capital requirements, be commensurate with the risk to

which the Company's capital is exposed, support reasonable credit quality, and allow the Company to raise capital on reasonable terms.

Q. WHAT FACTORS HAVE YOU CONSIDERED IN MEASURING THE COST OF EQUITY IN THIS CASE?

A. The models that I used to measure the cost of common equity for the Company were applied with market and financial data developed for my proxy group of seven natural gas companies. The proxy group consists of companies that: (i) are engaged in the natural gas distribution business, (ii) have publicly-traded common stock, (iii) are contained in The Value Line Investment Survey, (iv) have not recently cut or omitted their dividend, (v) are not currently the target of a merger or acquisition, (vi) operate with a weather normalization and/or decoupling feature to their tariff, and (vii) have at least 60% of their assets subject to utility regulation. The companies in the proxy group are identified on page 2 of Attachment NG-PRM-13. I will refer to these companies as the "Gas Group" throughout my testimony.

Q. HOW HAVE YOU PERFORMED YOUR COST OF EQUITY ANALYSIS WITH THE MARKET DATA FOR THE GAS GROUP?

A. I have applied the models/methods for estimating the cost of equity using the average data for the Gas Group. I have not measured separately the cost of equity for the individual companies within the Gas Group, because the determination of the cost of equity for an individual company has become increasingly problematic. By employing group average data, rather than individual company's analysis, I have

helped to minimize the effect of extraneous influences on the market data for an individual company.

Q. PLEASE SUMMARIZE YOUR COST OF EQUITY ANALYSIS.

A. My cost of equity determination was derived from the results of the methods/models identified above. In general, the use of more than one method provides a superior foundation to arrive at the cost of equity. At any point in time, any single method can provide an incomplete measure of the cost of equity depending upon extraneous factors that may influence market sentiment. The specific application of these methods/models will be described later in my testimony. The following table provides a summary of the indicated costs of equity using each of these approaches.

	Gas Group
DCF	9.84%
RP	11.44%
CAPM	13.45%
Comparable Earnings	13.90%
Average	12.16%
Median	12.45%
Mid-point	11.87%

Focusing upon the market model approaches (i.e., DCF, RP and CAPM) to estimating the cost of equity, the average equity return is 11.58% (9.84% + 11.44%

+ 13.45% = 34.73% ÷ 3). The market measures of the cost of equity have been emphasized because they reflect fundamentals present in the stock and bond markets, rather than the business cycle alone, which is the principal determinant the Comparable Earnings approach. From these measures, I recommend that the Commission set the Company's rate of return on common equity at 11.50%.

II. NATURAL GAS RISK FACTORS

Q. WHAT FACTORS CURRENTLY AFFECT THE BUSINESS RISK OF NATURAL GAS UTILITIES?

A. Gas utilities face risks arising from competition, economic regulation, the business cycle, and customer usage patterns. Today, they operate in a more complex environment with time frames for decision-making considerably shortened. Their business profile is influenced by market-oriented pricing for the commodity distributed to customers and open access for the transportation of natural gas. Of particular concern for the Company, the recent high prices and volatility in natural gas commodity prices has had a negative impact on its customers, and has resulted in declines in average use per existing customer. Higher commodity prices mean higher customer bills, as the cost gas is recovered through the GCR mechanism. Higher and volatile gas costs may result in further declines in average use per existing customer and in fewer new customers selecting natural gas to meet their energy needs.

Natural gas utilities have focused increased attention on safety and reliability issues.

In order to address these issues and to comply with new and pending pipeline safety regulations, natural gas companies are now allocating more of their resources to addressing aging infrastructure issues.

Q. PLEASE INDICATE HOW ITS CONSTRUCTION PROGRAM AFFECTS THE COMPANY'S RISK PROFILE.

A. The Company is required to undertake investments to maintain and upgrade existing facilities in its service territory. To maintain safe and reliable service to existing customers, the Company must invest to upgrade its infrastructure. The testimony of Ms. Susan Fleck addresses the capital needs of the Company in order to address evolving pipeline safety regulations. Along those lines, the rehabilitation of the Company's infrastructure represents a non-revenue producing use of capital. The Company had 925 miles (or approximately 30%) of its distribution mains constructed of cast and ductile iron and unprotected steel pipe as of year-end 2006. Also, the Company has 68,235 (or approximately 37%) of its services constructed of unprotected steel and cast iron. The Company projects its construction expenditures will be approximately $280 million in the period 2008-2012. Of that amount, the Company expects to internally generate about 30% of its construction costs.

Q. HOW DOES THE COMPANY'S THROUGHPUT TO LARGE VOLUME USERS AFFECT ITS RISK PROFILE?

A. The Company's risk profile is influenced by natural gas sold/delivered to its ten

largest customers, which represent 43.3 million therms of throughput. Large volume users, which have traditionally used transportation service, have the ability to bypass the LDC system. To date, the Company has been proactive in its effort to avoid bypass. Success in this aspect of the Company's market is subject to the business cycle, the price of alternative energy sources, and pressures from competitors. Moreover, external factors can also influence the Company's throughput to these customers because cost factors can impact their operations relative to alternative facilities located outside the Company's service territory.

Q. DOES YOUR COST OF EQUITY ANALYSIS AND RECOMMENDATION TAKE INTO ACCOUNT THE COMPANY'S REVENUE DECOUPLING PROPOSAL?

A. Yes. The LDCs included in the Gas Group already have tariff mechanisms similar to decoupling, and therefore my analysis reflects the impact, if any, of decoupling on investor expectations through the use of market-determined models. The companies in the Gas Group have various forms of revenue stabilization, some of which are related to temperature variations and others to margin reconciliation. As such, the market prices of these companies' common stocks reflect the expectations of investors related to a regulatory mechanism that adjust revenues for conservation, abnormal weather, and other items. The trend in the industry is to stabilize the recovery of fixed costs, which are unaffected by usage. Indeed, there has been a proliferation of tracking mechanisms in the LDC business.

Q. HOW SHOULD THE COMMISSION RESPOND TO THE ISSUES FACING THE NATURAL GAS UTILITIES AND, IN PARTICULAR, NATIONAL GRID?

A. The Commission should recognize and take into account the heightened competitive environment and the risk it poses in the natural gas business in determining the cost of capital for the Company, and provide a reasonable opportunity for the Company to actually achieve its cost of capital. It should also recognize that the Company is subject to risk related to earnings attrition and regulatory lag since its costs are rising each year.

III. FUNDAMENTAL RISK ANALYSIS

Q. IS IT NECESSARY TO CONDUCT A FUNDAMENTAL RISK ANALYSIS TO PROVIDE A FRAMEWORK FOR DETERMINING A UTILITY'S COST OF EQUITY?

A. Yes. It is necessary to establish a company's relative risk position within its industry through a fundamental analysis of various quantitative and qualitative factors that bear upon investors' assessment of overall risk. The qualitative factors that bear upon the Company's risk have already been discussed. The quantitative risk analysis follows. The items that influence investors' evaluation of risk and their required returns are described in Attachment NG-PRM-3. For this purpose, I compared National Grid's gas operations in Rhode Island to the S&P Public Utilities, an industry-wide proxy consisting of various regulated businesses, and to

the Gas Group.

Q. WHAT ARE THE COMPONENTS OF THE S&P PUBLIC UTILITIES?

A. The S&P Public Utilities is a widely recognized index that is comprised of electric power and natural gas companies. These companies are identified on page 3 of Attachment NG-PRM-14.

Q. WHY HAVE YOU IMPOSED A SELECTION CRITERION THAT INCLUDES A PERCENTAGE OF GAS ASSETS?

A. In order to align the cost of equity determination to the gas business, I have employed screening criteria that impose a limitation on the non-gas businesses of the proxy companies. In this regard, there are three principal financial variables that could be employed to measure the role of non-gas business of a firm. These are revenues, operating income, and assets employed. I imposed a screening criterion whereby 60% of a company's assets must be devoted to the gas business to be included in the Gas Group.

I did not use revenues for this purpose because the margins on other business segments are generally dissimilar to the gas distribution business. Energy trading is a case in point, which would make revenue comparisons incompatible because of the small margins associated with this business segment.

I also did not use operating income for this purpose because of the margin issue discussed above. In addition, some non-regulated business segments may incur losses due to start-up, or other reasons, that can distort the percentage calculations.

I did use an asset screening criteria (the percentage of gas assets) because it best describes the amount of capital that a firm devotes to each business segment. It is the potential return on that capital that represents the primary focus of investors when they value the securities of a firm.

The Gas Group has the following percentage of its operations from the gas utility business: revenues 70%, income 69%, and assets 86%. These determinations were made to the extent that information was revealed in each company's 2006 annual report.

Q. IS KNOWLEDGE OF A UTILITY'S BOND RATING AN IMPORTANT FACTOR IN ASSESSING ITS RISK AND COST OF CAPITAL?

A. Yes. Knowledge of a company's credit quality rating is important because the cost of each type of capital is directly related to the associated risk of the firm. So while a company's credit quality risk is shown directly by the rating and yield on its bonds, these relative risk assessments also bear upon the cost of equity. This is because a firm's cost of equity is represented by its borrowing cost plus compensation to recognize the higher risk of an equity investment compared to debt.

Q. HOW DO THE BOND RATINGS COMPARE FOR NATIONAL GRID, THE GAS GROUP, AND THE S&P PUBLIC UTILITIES?

A. The Company has six series of publicly held first mortgage bonds rate A2 by Moody's and A by S&P. The Company also has an issuer rating of A3 by Moody's

and A- by S&P. The corporate credit rating ("CCR") for National Grid USA is A- from Standard and Poor's Corporation ("S&P"), and the Long Term ("LT") issuer rating is A3 from Moody's Investors Services ("Moody's"). The CCR designation by S&P and LT issuer rating by Moody's focus upon the credit quality of the issuer of the debt, rather than upon the debt obligation itself. The average credit quality of the Gas Group is an A from S&P and A3 from Moody's. For the S&P Public Utilities, the average composite rating is BBB+ by S&P and Baa1 by Moody's. Many of the financial indicators that I will subsequently discuss are considered during the rating process.

Q. HOW DOES THE FINANCIAL DATA COMPARE FOR NATIONAL GRID, THE GAS GROUP, AND THE S&P PUBLIC UTILITIES?

A. The broad categories of financial data that I will discuss are shown on Attachments NG-PRM-12, NG-PRM-13, and NG-PRM-14. The data cover the five-year period 2002-2006. The financial analysis that I have presented on Attachment NG-PRM-12 is quite sketchy. As a division of Southern Union throughout the period 2002 through 2006, the Company's capitalization reported in the FERC Form No. 2, the source of the financial data presented on Attachment NG-PRM-12, was represented entirely by "retained earnings." Also, there were minimal amounts of interest expenses recognized on the Company's income statement and no income taxes were recorded therein. Also, Southern Union did not record any "dividend payouts" during the period, which together with minimal interest expense and no income

taxes provided enough internally generated funds to finance all construction expenditures.

For the data that is available for the Company, and for the Gas Group and S&P Public Utilities, the important categories of relative risk may be summarized as follows:

Size. In terms of capitalization, National Grid's gas operations in Rhode Island is smaller than the average size of the Gas Group, and very much smaller than the average size of the S&P Public Utilities. All other things being equal, a smaller company is riskier than a larger company because a given change in revenue and expense has a proportionately greater impact on a small firm. As I will demonstrate later, the size of a firm can impact its cost of equity. This is the case for the Gas Group and the Company.

Market Ratios. Market-based financial ratios, such as earnings/price ratios and dividend yields, provide a partial measure of the investor-required cost of equity. If all other factors are equal, investors will require a higher rate of return for companies that exhibit greater risk, in order to compensate for that risk. That is to say, a firm that investors perceive to have higher risks will experience a lower price per share in relation to expected earnings.[1]

[1] For example, two otherwise similarly situated firms each reporting $1.00 in earnings per share would have different market prices at varying levels of risk (i.e., the firm with a higher level of risk will have a lower share value, while the firm with a lower risk profile will have a higher share value).

There are no market ratios available for Narragansett because National Grid USA owns its stock. The five-year average price-earnings multiple for the Gas Group was fairly similar to that of the S&P Public Utilities. The five-year average dividend yields were somewhat higher for the Gas Group as compared to the S&P Public Utilities. The average market-to-book ratios were somewhat higher for the Gas Group than the S&P Public Utilities.

Common Equity Ratio. The level of financial risk is measured by the proportion of long-term debt and other senior capital that is contained in a company's capitalization. Financial risk is also analyzed by comparing common equity ratios (the complement of the ratio of debt and other senior capital). That is to say, a firm with a high common equity ratio has lower financial risk, while a firm with a low common equity ratio has higher financial risk. The five-year average common equity ratios, based on permanent capital, were 52.4% for the Gas Group and 41.2% for the S&P Public Utilities. For this case, since the Company does not have an identifiable capital structure, the common equity ratio that will be used to calculate its weighted average cost of capital will be based on the Gas Group. I have used the year-end 2006 capital structure ratios for this purpose, which consists of 46% long-term debt (rounded to the nearest percentage point from 46.4%) and 54% equity (rounded to the nearest percentage point from preferred stock equity of 0.5% and common stock equity of 53.2%). In order to confirm the reasonableness of these ratios, I have verified them by considering analysts' forecasts, which influence

investor expectations. Those comparisons are provided below based upon data widely available to investors from Value Line.

	Common Equity Ratio		
	2007	2008	2010-12
AGL Resources	51.5%	51.5%	51.5%
Atmos Energy	48.0%	48.0%	49.0%
New Jersey Resources	67.0%	69.5%	72.8%
Northwest Natural Gas	53.0%	53.0%	52.0%
Piedmont Natural Gas	51.0%	50.0%	50.8%
South Jersey Industries	57.0%	57.0%	59.0%
WGL Resources	60.3%	63.4%	65.8%
Gas Group Average	55.4%	56.1%	57.3%

Source:
The Value Line Investment Survey, December 14, 2007

These forecasts show that the proposed capital structure ratios for this case are reasonable.

Return on Book Equity. Greater variability (i.e., uncertainty) of a firm's earned returns signifies relatively greater levels of risk, as shown by the coefficient of variation (standard deviation ÷ mean) of the rate of return on book common equity. The higher the coefficients of variation, the greater degree of variability. For the five-year period, the coefficients of variation were 0.301 (4.1% ÷ 13.6%) for National Grid, 0.058 (0.7% ÷ 12.1%) for the Gas Group, and 0.159 (1.7% ÷ 10.7%) for the S&P Public Utilities. Although National Grid appears to have higher earnings variability as compared to the Gas Group, the lack of an identifiable

amount of capital makes any conclusions in this regard tenuous.

Operating Ratios. I have also compared operating ratios (the percentage of revenues consumed by operating expense, depreciation, and taxes other than income).[2] The five-year average operating ratios were 91.4% for National Grid, 87.6% for the Gas Group, and 84.0% for the S&P Public Utilities. The Company displays somewhat higher operating risk as compared to the Gas Group. In this regard, the Company's operating ratio is unaffected by some of the accounting issues that I previously described.

Coverage. The level of fixed charge coverage (i.e., the multiple by which available earnings cover fixed charges, such as interest expense) provides an indication of the earnings protection for creditors. Higher levels of coverage, and hence earnings protection for fixed charges, are usually associated with superior grades of creditworthiness. The five-year average interest coverage (excluding Allowance for Funds Used during Construction ("AFUDC") was 4.20 times for the Gas Group and 2.89 times for the S&P Public Utilities.

Quality of Earnings. Measures of earnings quality usually are revealed by the percentage of AFUDC related to income available for common equity, the effective income tax rate, and other cost deferrals. These measures of earnings quality usually influence a firm's internally generated funds because poor quality of

[2] The complement of the operating ratio is the operating margin which provides a measure of profitability. The higher the operating ratio, the lower the operating margin.

earnings would not generate high levels of cash flow. Quality of earnings has not been a significant concern for National Grid, the Gas Group, and the S&P Public Utilities.

Internally Generated Funds. Internally generated funds ("IGF") provide an important source of new investment capital for a utility and represent a key measure of credit strength. Historically, the five-year average percentage of IGF to capital expenditures was 92.1% for the Gas Group and 110.1% for the S&P Public Utilities. I previously explained the Company's cash flow situation under the ownership of Southern Union.

Betas. The financial data that I have been discussing relate primarily to company-specific risks. Market risk for firms with publicly-traded stock is measured by beta coefficients. Beta coefficients attempt to identify systematic risk, i.e., the risk associated with changes in the overall market for common equities. [3] Value Line publishes such a statistical measure of a stock's relative historical volatility to the rest of the market. A comparison of market risk is shown by the Value Line beta of .86 as the average for the Gas Group (see page 2 of Attachment NG-PRM-13), and .95 as the average for the S&P Public Utilities (see page 3 of Attachment NG-PRM-14).

[3] The procedure used to calculate the beta coefficient published by Value Line is described in Attachment NG-PRM-9. A common stock that has a beta less than 1.0 is considered to have less systematic risk than the market as a whole and would be expected to rise and fall more slowly than the rest of the market. A stock with a beta above 1.0 would have more systematic risk.

Q. PLEASE SUMMARIZE YOUR RISK EVALUATION.

A. There is a limited amount of data that can be compared for National Grid and the Gas Group. Of the few items that are available, the Company is smaller than the average size of the Gas Group and its operating risk is somewhat higher because its operating ratio is higher than the average of the Gas Group. I have used the capital structure data from the Gas Group to develop the capital structure ratios for the Company, so by definition the financial risk of the Company for this case is similar to the Gas Group. The coefficient of variation of the Company's earnings historically has been higher than the Gas Group, thus indicating a higher level of risk for National Grid. On balance, the cost of equity for the Gas Group would provide a reasonable basis for measuring the Company's cost of equity for this case especially in light of the fact that the Gas Group serves as a proxy for the Company's capital structure.

IV. COST OF EQUITY – GENERAL APPROACH

Q. PLEASE DESCRIBE THE PROCESS YOU EMPLOYED TO DETERMINE THE COST OF EQUITY FOR THE COMPANY.

A. Although my fundamental financial analysis provides the required framework to establish the risk relationships between National Grid, the Gas Group and the S&P Public Utilities, the cost of equity must be measured by standard financial models that I describe in Attachment NG-PRM-4. Differences in risk traits, such as size, business diversification, geographical diversity, regulatory policy, financial

leverage, and bond ratings must be considered when analyzing the cost of equity indicated by the models.

It also is important to reiterate that no one method or model of the cost of equity can be applied in an isolated manner given the constraints associated with each method/model (see Attachment NG-PRM-4). Rather, informed judgment must be used to take into consideration the relative risk traits of the firm. It is for this reason that I have used more than one method to measure the Company's cost of equity. Therefore, I favor considering the results from a variety of methods. In this regard, I applied each of the methods with data taken from the Gas Group and have arrived at a cost of equity of 11.50% for National Grid.

V. DISCOUNTED CASH FLOW ANALYSIS

Q. PLEASE DESCRIBE YOUR USE OF THE DISCOUNTED CASH FLOW APPROACH TO DETERMINE THE COST OF EQUITY.

A. As noted above, I used the DCF method as one indicator of the cost of equity to be taken into consideration with other methods. The details of my use of the DCF approach and the calculations and evidence in support of my conclusions are set forth in Attachment NG-PRM-5. I will summarize them here. The Discounted Cash Flow ("DCF") model seeks to explain the value of an asset as the present value of future expected cash flows discounted at the appropriate risk-adjusted rate of return. In its simplest form, the DCF return on common stocks consists of a current cash (dividend) yield and future price appreciation (growth) of the

investment.

Among other limitations of the model, there is a certain element of circularity in the DCF method when applied in rate cases. This is because investors' expectations for the future depend upon regulatory decisions. In turn, when regulators depend upon the DCF model to set the cost of equity, they rely upon investor expectations that include an assessment of how regulators will decide rate cases. Due to this circularity, the DCF model may not fully reflect the true risk of a utility.

As I describe in Attachment NG-PRM-5, the DCF approach has other limitations that diminish its usefulness in the ratesetting process when the market capitalization diverges significantly from the book value capitalization. When this situation exists, as it does here, the unadjusted DCF method will lead to a misspecified cost of equity when it is applied to a book value capital structure. Therefore, the DCF method must include an adjustment to account for this variance.

Q. PLEASE EXPLAIN THE DIVIDEND YIELD COMPONENT OF A DCF ANALYSIS.

A. The DCF methodology requires the use of an expected dividend yield to establish the investor-required cost of equity. For the twelve months ended December 2007, the monthly dividend yields of the Gas Group are shown graphically on Attachment NG-PRM-15. The monthly dividend yields shown on Attachment NG-PRM-15 reflect an adjustment to the month-end prices to reflect the build up of the dividend in the price that has occurred since the last ex-dividend date (i.e., the date by which

a shareholder must own the shares to be entitled to the dividend payment – usually about two to three weeks prior to the actual payment). An explanation of this adjustment is provided in Attachment NG-PRM-5.

For the twelve months ending December 2007, the average dividend yield was 3.67% for the Gas Group based upon a calculation using annualized dividend payments and adjusted month-end stock prices. The dividend yields for the more recent six- and three-month periods was 3.77% for both periods. I have used, for the purpose of my direct testimony, a dividend yield of 3.77% for the Gas Group, which represents the six-month average yield.

For the purpose of a DCF calculation, the average dividend yields must be adjusted to reflect the prospective nature of the dividend payments i.e., the higher expected dividends for the future, because the DCF is an expectational model that must reflect investor anticipated cash flows for the Gas Group. I have adjusted the six-month average dividend yield in three different, but generally accepted manners, and used the average of the three adjusted values as calculated in Attachment NG-PRM-5. That adjusted dividend yield is 3.86% for the Gas Group.

Q. PLEASE EXPLAIN THE UNDERLYING FACTORS THAT INFLUENCE INVESTOR'S GROWTH EXPECTATIONS.

A. As noted previously, investors are interested principally in the future growth of their investment (i.e., the price per share of the stock). As I explain in Attachment NG-PRM-5, future earnings per share growth represents their primary focus because

under the constant price-earnings multiple assumption of the DCF model, the price per share of stock will grow at the same rate as earnings per share. In conducting a growth rate analysis, a wide variety of variables can be considered when reaching a consensus of prospective growth. The variables that can be considered include: earnings, dividends, book value, and cash flow stated on a per share basis. Historical values for these variables can be considered, as well as analysts' forecasts that are widely available to investors.

A fundamental growth rate analysis also can be formulated, which consists of internal growth ("b x r"), where "r" represents the expected rate of return on common equity and "b" is the retention rate that consists of the fraction of earnings that are not paid out as dividends. The internal growth rate can be modified to account for sales of new common stock -- this is called external growth ("s x v"), where "s" represents the new common shares expected to be issued by a firm and "v" represents the value that accrues to existing shareholders from selling stock at a price different from book value. Fundamental growth, which combines internal and external growth, provides an explanation of the factors that cause book value per share to grow over time. Hence, a fundamental growth rate analysis is duplicative of expected book value per share growth.

Growth also can be expressed in multiple stages. This expression of growth consists of an initial "growth" stage where a firm enjoys rapidly expanding markets, high profit margins, and abnormally high growth in earnings per share. Thereafter,

a firm enters a "transition" stage where fewer technological advances and increased product saturation begin to reduce the growth rate and profit margins come under pressure. During the "transition" phase, investment opportunities begin to mature, capital requirements decline, and a firm begins to pay out a larger percentage of earnings to shareholders. Finally, the mature or "steady-state" stage is reached when a firm's earnings growth, payout ratio, and return on equity stabilizes at levels where they remain for the life of a firm. The three stages of growth assume a step-down of high initial growth to lower sustainable growth. Even if these three stages of growth can be envisioned for a firm, the third "steady-state" growth stage, which is assumed to remain fixed in perpetuity, represents an unrealistic expectation because the three stages of growth can be repeated during the life of a business. That is to say, in many circumstances, the growth of a firm may ramp-up and ramp-down in cycles over time.

Q. <u>WHAT INVESTOR-EXPECTED GROWTH RATE IS APPROPRIATE IN A DCF CALCULATION?</u>

A. Investors consider both company-specific variables and overall market sentiment (i.e., level of inflation rates, interest rates, economic conditions, etc.) when balancing its capital gains expectations with its dividend yield requirements. I follow an approach that is not rigidly formatted because investors are not influenced by a single set of company-specific variables weighted in a formulaic manner. Therefore, in my opinion, all relevant growth rate indicators using a variety of

techniques must be evaluated when formulating a judgment of investor expected growth.

Q. WHAT COMPANY-SPECIFIC DATA HAVE YOU CONSIDERED IN YOUR GROWTH RATE ANALYSIS?

A. I have considered the growth in the financial variables shown on Attachment NG-PRM-16 and 17. The bar graph provided on Attachment NG-PRM-16 shows the historical growth rates in earnings per share, dividends per share, book value per share, and cash flow per share for the Gas Group. The historical growth rates were taken from the Value Line publication that provides these data. As shown on Attachment NG-PRM-16, historical growth in earnings per share was in the range of 5.50% to 8.07% for the Gas Group.

Attachment NG-PRM-17 provides projected earnings per share growth rates taken from analysts' forecasts compiled by IBES/First Call, Zacks, and Reuters/Market Guide and from the Value Line publication. IBES/First Call, Zacks, and Reuters/Market Guide represent reliable authorities of projected growth upon which investors rely. The IBES/First Call, Zacks, and Reuters/Market Guide forecasts are limited to earnings per share growth, while Value Line makes projections of other financial variables. The Value Line forecasts of dividends per share, book value per share, and cash flow per share have also been included on Attachment NG-PRM-17 for the Gas Group.

Although five-year forecasts usually receive the most attention in the growth

analysis for DCF purposes, present market performance has been strongly influenced by short-term earnings forecasts. Each of the major publications provides earnings forecasts for the current and subsequent year. These short-term earnings forecasts receive prominent coverage, and indeed they dominate these publications. While the DCF model typically focuses upon long-run estimates of earnings, stock prices are clearly influenced by current and near-term earnings forecasts.

Q. WHAT SPECIFIC EVIDENCE HAVE YOU CONSIDERED IN THE DCF GROWTH ANALYSIS?

A. As to the five-year forecast growth rates, Attachment NG-PRM-17 indicates that the projected earnings per share growth rates for the Gas Group are 5.18% by IBES/First Call, 5.50% by Zacks, 5.24% by Reuters/Market Guide, and 5.03% by Value Line. The Value Line projections indicate that earnings per share for the Gas Group will grow prospectively at a more rapid rate (i.e., 5.03%) than the dividends per share (i.e., 4.29%), which indicates a declining dividend payout ratio for the future. As indicated earlier, and in Attachment NG-PRM-5, with the constant price-earnings multiple assumption of the DCF model, growth for these companies will occur at the higher earnings per share growth rate, thus producing the capital gains yield expected by investors.

Q. WHAT CONCLUSION HAVE YOU DRAWN FROM THESE DATA?

A. Ideally historical and projected earnings per share and dividends per share growth

indicators would be used to provide an assessment of investor growth expectations for a firm; however, the circumstances of the Gas Group mandate that the greater emphasis be placed upon projected earnings per share growth. In this regard, it is worthwhile to note that Professor Myron Gordon, the foremost proponent of the DCF model in rate cases, concluded that the best measure of growth in the DCF model is forecasts of earnings per share growth.[4] Hence, to follow Professor Gordon's findings, projections of earnings per share growth, such as those published by IBES/First Call, Zacks, Reuters/Market Guide, and Value Line, represent a reasonable assessment of investor expectations.

It is appropriate to consider all forecasts of earnings growth rates that are available to investors. In this regard, I have considered the forecasts from IBES/First Call, Zacks, Reuters/Market Guide and Value Line. The IBES/First Call, Zacks, and Reuters/Market Guide growth rates are consensus forecasts taken from a survey of analysts that make projections of growth for these companies. The IBES/First Call, Zacks, and Reuters/Market Guide estimates are obtained from the Internet and are widely available to investors free-of-charge. First Call is probably quoted most frequently in the financial press when reporting on earnings forecasts. The Value Line forecasts are also widely available to investors and can be obtained by subscription or free-of-charge at most public and collegiate libraries.

The forecasts of earnings per share growth, as shown on Attachment NG-PRM-17

[4] "Choice Among Methods of Estimating Share Yield," The Journal of Portfolio Management, spring 1989 by Gordon, Gordon & Gould.

provide a range of growth rates of 5.03% to 5.50%. Although the DCF growth rates cannot be established solely with a mathematical formulation, it is my opinion that an investor-expected growth rate of 5.25% is within the array of earnings per share growth rates shown by the analysts' forecasts.

Q. ARE THE DIVIDEND YIELD AND GROWTH COMPONENTS OF THE DCF ADEQUATE TO EXPLAIN THE RATE OF RETURN ON COMMON EQUITY WHEN IT IS USED IN THE CALCULATION OF THE WEIGHTED AVERAGE COST OF CAPITAL?

A. Only if the capital structure ratios are measured with the market value of debt and equity. If book values are used to compute the capital structure ratios, then an adjustment is required.

Q. PLEASE EXPLAIN WHY.

A. If regulators rely upon the results of the DCF (which are based on the market price of the stock of the companies analyzed) and those results are used in computing the weighted average cost of capital with a book value capital structure, those results will not reflect the degree of financial risk associated with the capital structure shown by the market capitalization. When the price diverges from book value, the potential exists for a financial risk difference, whereby the capitalization of a utility measured at its market value contains relatively less debt and more equity than the capitalization measured at its book value.

This shortcoming of the DCF has persuaded one regulatory agency to adjust the

cost of equity upward to make the return consistent with the book value capital structure. Provisions for this risk difference were made by the Pennsylvania Public Utility Commission in the following cases:

- January 10, 2002 for Pennsylvania-American Water Company in Docket No. R-00016339 -- 60 basis points adjustment.
- August 1, 2002 for Philadelphia Suburban Water Company in Docket No. R-00016750 -- 80 basis points adjustment.
- January 29, 2004 for Pennsylvania-American Water Company in Docket No. R-00038304 (affirmed by the Commonwealth Court on November 8, 2004) -- 60 basis points adjustment.
- August 5, 2004 for Aqua Pennsylvania, Inc. in Docket No. R-00038805 -- 60 basis points adjustment.
- December 22, 2004 for PPL Electric Utilities Corporation in Docket No. R-00049255 -- 45 basis points.
- February 8, 2007 for PPL Gas Utilities Corporation in Docket No. R-00061398 -- 70 basis points adjustment.

It must be recognized that in order to make the DCF results relevant to a utility's capitalization measured at book value (as is done for rate setting purposes), the market-derived cost rate cannot be used without modification. As I will explain later in my testimony, the results of the DCF model must be modified to account for differences in risk when the book value capital structure contains more financial leverage than the market value capital structure.

Q. IS YOUR LEVERAGE ADJUSTMENT TO THE DCF MODEL DEPENDENT UPON THE MARKET VALUATION OR BOOK VALUATION FROM AN INVESTOR'S PERSPECTIVE?

A. The only perspective that is important to investors is the return that they can realize on the market value of their investment. As I have measured the DCF, the simple

yield (D/P) plus growth (g) provides a return applicable strictly to the price (P) that an investor is willing to pay for a share of stock. The DCF formula is derived from the standard valuation model: P = D/ (k-g), where P = price, D = dividend, k = the cost of equity, and g = growth in cash flows. By rearranging the terms, we obtain the familiar DCF equation: k= D/P+g. All of the terms in the DCF equation represent investors' assessment of expected future cash flows that they will receive in relation to the value that they set for a share of stock (P). The need for the leverage adjustment arises when the results of the DCF model (k) are to be applied to a capital structure that is different than indicated by the market price (P). From the market perspective, the financial risk of the Gas Group is accurately measured by the capital structure ratios calculated from the market capitalization of a firm. If the ratesetting process utilizes the market capitalization ratios, then no additional analysis or adjustment would be required, and the simple yield (D/P) plus growth (g) components of the DCF would satisfy the financial risk associated with the market value of the equity capitalization. Since the ratesetting process uses a different set of ratios calculated from the book value capitalization, further analysis is required to synchronize the financial risk of the book capitalization with the required return on the book value of the equity. This adjustment is developed through precise mathematical calculations, using well recognized analytical procedures that are widely accepted in the financial literature. To arrive at that return, the rate of return on common equity is the unleveraged cost of capital (or equity return at 100% equity) plus a term(s) reflecting the increase in financial risk

resulting from the use of leverage in the capital structure. Multiple terms are used in the case of both debt and preferred stock. The resulting return is the one that is necessary for the utility to earn on its own book value capital structure to reflect the financial risk that varies from the return that applies to the market value capital structure.

Q. ARE THERE SPECIFIC FACTORS THAT INFLUENCE MARKET-TO-BOOK RATIOS THAT DETERMINE WHETHER THE LEVERAGE ADJUSTMENT SHOULD BE MADE?

A. No. The leverage adjustment I use is not intended, nor was it designed, to address the reasons that stock prices vary from book value. Hence, any observations concerning market prices relative to book are not on point. The leverage adjustment I use deals with the issue of financial risk and is not intended to transform the DCF result to a book value return through a market-to-book adjustment. Again, the leverage adjustment that I propose is based on the fundamental financial precept that the cost of equity is equal to the rate of return for an unleveraged firm (i.e., where the overall rate of return equates to the cost of equity with a capital structure that contains 100% equity) plus the additional return required for introducing debt and/or preferred stock leverage into the capital structure. This is the foundation of the principal that capital structure influences the cost of equity.

Further, as noted previously, the high market prices of utility stocks cannot be

attributed solely to the notion that these companies are expected to earn a return on equity that differs from their respective costs of equity. Stock prices above book value are common for utility stocks, and indeed non-regulated stock prices exceed book values by even greater margins. In this regard, according to the Barron's issue of January 7, 2008, the major market indices' market-to-book ratios are well above unity. Utility stocks trade at a multiple of 2.75 times book value which is below the market multiple of other indices. For example, the S&P 500 index trades at 2.80 times book value, the S&P Industrial index is at 3.46 times book value, and the Dow Jones Industrial index is at 3.85 times book value. It is highly doubtful to accept that the vast majority of all firms operating in our economy are generating returns far in excess of their cost of capital. Certainly, in our free-market economy, competition should contain such "excesses" if they indeed exist.

Finally, the leverage adjustment adds stability to the final DCF cost rate. That is to say, as the market capitalization increases relative to its book value, the leverage adjustment increases while the simple yield (D/P) plus growth (g) result declines. The reverse is also true that when the market capitalization declines, the leverage adjustment also declines as the simple yield (D/P) plus growth (g) result increases.

Q. WHAT ARE THE IMPLICATIONS OF A DCF DERIVED RETURN THAT IS RELATED TO MARKET VALUE WHEN THE RESULTS ARE APPLIED TO THE BOOK VALUE OF A UTILITY'S CAPITALIZATION?

A. The capital structure ratios measured at the utility's book value show more financial

leverage, and higher risk, than the capitalization measured at its market values. Please refer to Attachment NG-PRM-5 for the comparison. This means that a market-derived cost of equity, using models such as DCF and CAPM, reflects a level of financial risk that is different from that shown by the book value capitalization. Hence, it is necessary to develop a cost of equity that reflects the higher financial risk related to the book value capitalization used for ratesetting purposes. Failure to make this modification would result in a mismatch of the lower financial risk related to market value used to measure the cost of equity and the higher financial risk of the book value capital structure used in the ratesetting process. That is to say, the cost of equity for the Gas Group that is related to the 54.44% common equity ratio using book value has higher financial risk than the 68.29% common equity ratio using market values. Because the ratesetting process utilizes the book value capitalization, it is necessary to adjust the market-determined cost of equity for the higher financial risk related to the book value of the capitalization.

Q. HOW IS THE DCF-DETERMINED COST OF EQUITY ADJUSTED FOR THE FINANCIAL RISK ASSOCIATED WITH THE BOOK VALUE OF THE CAPITALIZATION?

A. In pioneering work, Nobel laureates Modigliani and Miller developed several theories about the role of leverage in a firm's capital structure. As part of that work, Modigliani and Miller established that, as the borrowing of a firm increases, the

expected return on stockholders' equity also increases. This principle is incorporated into my leverage adjustment which recognizes that the expected return on equity increases to reflect the increased risk associated with the higher financial leverage shown by the book value capital structure, as compared to the market value capital structure that contains lower financial risk. Modigliani and Miller proposed several approaches to quantify the equity return associated with various degrees of debt leverage in a firm's capital structure. These formulas point toward an increase in the equity return associated with the higher financial risk of the book value capital structure. Simply stated, my leverage adjustment contains no factor for a particular market-to-book ratio. It merely expresses the cost of equity as the unleveraged return plus compensation for the additional risk of introducing debt and/or preferred stock into the capital structure. There can be no dispute that a firm's financial risk varies with the relative amount of leverage contained in its capital structure. As detailed in Attachment NG-PRM-5, the Modigliani and Miller theory shows that the cost of equity increases by 0.54% (9.65% - 9.11%) when the book value of equity, rather than the market value of equity, is used to compute the weighted average cost of capital.

Q. PLEASE PROVIDE THE DCF RETURN BASED UPON YOUR PRECEDING DISCUSSION OF DIVIDEND YIELD, GROWTH, AND LEVERAGE.

A. As explained previously, I have utilized a six-month average dividend yield ("D_1

/P_0") adjusted in a forward-looking manner for my DCF calculation. This dividend yield is used in conjunction with the growth rate ("g ") previously developed. The DCF also includes the leverage modification ("lev.") required when the book value equity ratio is used in determining the weighted average cost of capital in the ratesetting process rather than the market value equity ratio related to the price of stock. The cost of equity must also include an adjustment to cover flotation costs ("flot."). The factor used to develop the modification that would account for the flotation costs adjustment is provided in Attachment NG-PRM-6 and Attachment NG-PRM-18.

Q. WHAT DCF COST RATE HAVE YOU CALCULATED?

A. The resulting DCF cost rate is:

	D_1/P_0	+	g	+	*lev.*	=	k	x	*flot.*	=	K
Gas Goup	3.86%	+	5.25%	+	0.54%	=	9.65%	x	1.02	=	9.84%

As I have explained throughout my testimony, each method/model of the cost of equity contains certain assumptions that are not optimal. The DCF results provided above are one of several methods that I have used to measure the rate of return on common equity for the Company. Although the Commission has used the DCF model in the past, it has less significance in this case. Indeed, the DCF model is providing atypical results. That is to say, the low DCF returns can be traced in part to the unfavorable investor sentiment for the gas companies. As shown on page 5 of Attachment NG-PRM-21, the gas distribution companies are viewed as relatively

unattractive investments and are ranked 80 out of 98 industries by Value Line for probable performance over the next twelve months. In comparison, the regional electric companies are ranked 59 in the East, 65 in the Central and 82 in the West; while the water companies are ranked 91 for probable performance over the next twelve months. The significance of this low ranking is that performance for the gas companies is expected to be subpar, thereby indicating that the DCF results will not provide a cost of equity indication that corresponds with the results of the other methods/models. Indeed, the DCF results for the Gas Group are low, while the CAPM results show a much higher result for the Gas Group. This raises serious questions regarding the reliability of the DCF results for the Gas Group. Notwithstanding these failings, I have submitted a DCF calculation so the Commission will have that information. I have not ignored the DCF results, but rather have weighed it equally to two other methods (risk premium and CAPM) that I rely on.

As indicated by the DCF result shown above, the flotation cost adjustment adds 0.19% (9.84% - 9.65%) to the rate of return on common equity for the Gas Group. In my opinion, this adjustment is reasonable for reasons explained in Attachment NG-PRM-6. The DCF result shown above represents the simplified (i.e., Gordon) form of the model that contains a constant growth assumption. I should reiterate, however, that the DCF indicated cost rate provides an explanation of the rate of return on common stock market prices without regard to the prospect of a change in the price-earnings multiple. An assumption that there will be no change in the

price-earnings multiple is not supported by the realities of the equity market, because price-earnings multiples do not remain constant, which is another reason why less reliance should be placed on the DCF results.

VI. RISK PREMIUM ANALYSIS

Q. PLEASE DESCRIBE YOUR USE OF THE RISK PREMIUM APPROACH TO DETERMINE THE COST OF EQUITY.

A. The details of my use of the Risk Premium approach and the evidence in support of my conclusions are set forth in Attachment NG-PRM-8. I will summarize them here. With this method, the cost of equity capital is determined by corporate bond yields plus a premium to account for the fact that common equity is exposed to greater investment risk than debt capital. As with other models of the cost of equity, the Risk Premium approach has its limitations, including an accurate assessment of the future cost of corporate debt and the measurement of the risk-adjusted common equity premium.

Q. WHAT LONG-TERM PUBLIC UTILITY DEBT COST RATE DID YOU USE IN YOUR RISK PREMIUM ANALYSIS?

A. In my opinion, a 6.00% yield represents a reasonable estimate of the prospective yield on long-term A-rated public utility bonds. As I will subsequently show, the Moody's index and the Blue Chip forecasts support this figure.

The historical yields for long-term public utility debt are shown graphically on page

1 of Attachment NG-PRM-19. For the twelve months ended October 2007, the average monthly yield on Moody's A-rated index of public utility bonds was 6.03%. For the six and three-month periods ended October 2007, the yields were 6.18% for both periods. During the twelve-months ended October 2007, the range of the yields on A-rated public utility bonds was 5.80% to 6.30%.

Q. WHAT FORECASTS OF INTEREST RATES HAVE YOU CONSIDERED IN YOUR ANALYSIS?

A. I have determined the prospective yield on A-rated public utility debt by using the Blue Chip Financial Forecasts ("Blue Chip") along with the spread in the yields that I describe in Attachment NG-PRM-7. The Blue Chip is a reliable authority and contains consensus forecasts of a variety of interest rates compiled from a panel of banking, brokerage, and investment advisory services. In early 1999, Blue Chip stopped publishing forecasts of yields on A-rated public utility bonds because the Federal Reserve deleted these yields from its Statistical Release H.15. To independently project a forecast of the yields on A-rated public utility bonds, I have combined the forecast yields on long-term Treasury bonds published on January 1, 2008, and the yield spread of 1.25%, that is supported by the data shown on pages 3 and 4 of Attachment NG-PRM-19 and explained in Attachment NG-PRM-7. For comparative purposes, I also have shown the Blue Chip forecasts for Aaa-rated and Baa-rated corporate bonds:

		Blue Chip Financial Forecasts				
		Corporate		30-Year	A-rated Public Utility	
Year	Quarter	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2008	First	5.4%	6.4%	4.5%	1.25%	5.75%
2008	Second	5.5%	6.5%	4.5%	1.25%	5.75%
2008	Third	5.5%	6.6%	4.6%	1.25%	5.85%
2008	Fourth	5.6%	6.7%	4.7%	1.25%	5.95%
2009	First	5.7%	6.8%	4.8%	1.25%	6.05%
2009	Second	5.8%	6.9%	4.9%	1.25%	6.15%

Q. ARE THERE ADDITIONAL FORECASTS OF INTEREST RATES THAT EXTEND BEYOND THOSE SHOWN ABOVE?

A. Yes. Twice yearly, Blue Chip provides long-term forecasts of interest rates. In its December 1, 2007 publication, the Blue Chip published forecasts of interest rates as follows:

	Blue Chip Financial Forecasts				
	Corporate		30-Year	A-rated Public Utility	
Averages	Aaa-rated	Baa-rated	Treasury	Spread	Yield
2009-13	6.0%	7.0%	5.2%	1.25%	6.45%
2014-18	6.1%	7.0%	5.3%	1.25%	6.55%

Given these forecast interest rates, a 6.00% yield on A-rated public utility bonds represents a reasonable expectation.

Q. HOW DID YOU DETERMINE THE EQUITY RISK PREMIUM FOR PUBLIC UTILITIES?

A. Attachment NG-PRM-8 provides a discussion of the financial returns that I relied upon to develop the appropriate equity risk premium for the S&P Public Utilities. I have calculated the equity risk premium by comparing the market returns on utility

stocks and the market returns on utility bonds. I chose the S&P Public Utility index for the purpose of measuring the market returns for utility stocks. The S&P Public Utility index is reflective of the risk associated with regulated utilities, rather than some broader market indexes, such as the S&P 500 Composite index. The S&P Public Utility index is a subset of the overall S&P 500 Composite index. Use of the S&P Public Utility index reduces the role of judgment in establishing the risk premium for public utilities. With the equity risk premiums developed for the S&P Public Utilities as a base, I derived the equity risk premium for the Gas Group.

Q. WHAT EQUITY RISK PREMIUM FOR THE S&P PUBLIC UTILITIES HAVE YOU DETERMINED FOR THIS CASE?

A. To develop an appropriate risk premium, I analyzed the results for the S&P Public Utilities by averaging (i) the midpoint of the range shown by the geometric mean and median and (ii) the arithmetic mean. This procedure has been employed to provide a comprehensive way of measuring the central tendency of the historical returns. As shown by the values set forth on page 2 of Attachment NG-PRM-20, the indicated risk premiums for the various time periods analyzed are 5.37% (1928-2006), 6.40% (1952-2006), 5.61% (1974-2006), and 5.83% (1979-2006). The selection of the shorter periods taken from the entire historical series is designed to provide a risk premium that conforms more nearly to present investment fundamentals, and removes some of the more distant data from the analysis.

Q. DO YOU HAVE FURTHER SUPPORT FOR THE SELECTION OF THE TIME PERIODS USED IN YOUR EQUITY RISK PREMIUM DETERMINATION?

A. Yes. First, the terminal year of my analysis presented in Attachment NG-PRM-20 represents the returns realized through 2006. Second, the selection of the initial year of each period was based upon the events that I described in Attachment NG-PRM-8. These events were fixed in history and cannot be manipulated as later financial data becomes available. That is to say, using the Treasury-Federal Reserve Accord as a defining event, the year 1952 is fixed as the beginning point for the measurement period regardless of the financial results that subsequently occurred. Likewise, 1974 represented a benchmark year because it followed the 1973 Arab Oil embargo. Also, the year 1979 was chosen because it began the deregulation of the financial markets. As such, additional data are merely added to the earlier results when they become available, clearly showing that the periods chosen were not driven by the desired results of the study.

Q. WHAT CONCLUSIONS HAVE YOU DRAWN FROM THESE DATA?

A. Using the summary values provided on page 2 of Attachment NG-PRM-20,, the 1928-2006 period provides the lowest indicated risk premium, while the 1952-2006 period provides the highest risk premium for the S&P Public Utilities. Within these bounds, a common equity risk premium of 5.72% (5.61% + 5.83% = 11.44% ÷ 2) can be calculated from data covering the periods 1974-2006 and 1979-2006.

Therefore, 5.72% represents a reasonable risk premium for the S&P Public Utilities in this case.

As noted earlier in my fundamental risk analysis, differences in risk characteristics must be taken into account when applying the results for the S&P Public Utilities to the Gas Group. I recognized these differences in the development of the equity risk premium in this case. I previously enumerated various differences in fundamentals between the Gas Group and the S&P Public Utilities, including size, market ratios, common equity ratio, return on book equity, operating ratios, coverage, quality of earnings, internally generated funds, and betas. In my opinion, these differences indicate that 5.25% represents a reasonable common equity risk premium in this case. This represents approximately 92% (5.25% ÷ 5.72% = 0.92) of the risk premium of the S&P Public Utilities and is reflective of the risk of the Gas Group compared to the S&P Public Utilities.

Q. WHAT COMMON EQUITY COST RATE WOULD BE APPROPRIATE USING THIS EQUITY RISK PREMIUM AND THE YIELD ON LONG-TERM PUBLIC UTILITY DEBT?

A. The cost of equity (i.e., "k") is represented by the sum of the prospective yield for long-term public utility debt (i.e., "i") and the equity risk premium (i.e., "RP"). The Risk Premium approach provides a cost of equity of 11.44% as shown below.

	i	+	*RP*	=	*k*	+	*flot.*	=	*K*
Gas Group	6.00%	+	5.25%	=	11.25%	+	0.19%	=	11.44%

VII. CAPITAL ASSET PRICING MODEL

Q. HAVE YOU USED THE CAPITAL ASSET PRICING MODEL TO MEASURE THE COST OF EQUITY IN THIS CASE?

A. Yes, I have used the Capital Asset Pricing Model ("CAPM") in addition to my other methods. As with other models of the cost of equity, the CAPM contains a variety of assumptions that I discuss in Attachment NG-PRM-9. Therefore, this method should be used with other methods to measure the cost of equity, as each will complement the other and will provide a result that will alleviate the unavoidable shortcomings found in each method.

Q. WHAT ARE THE FEATURES OF THE CAPM AS YOU HAVE USED IT?

A. The CAPM uses the yield on a risk-free interest bearing obligation plus a rate of return premium that is proportional to the systematic risk of an investment. The details of my use of the CAPM and evidence in support of my conclusions are set forth in Attachment NG-PRM-9. To compute the cost of equity with the CAPM, three components are necessary: a risk-free rate of return ("Rf"), the beta measure of systematic risk ("β"), and the market risk premium ("Rm-Rf") derived from the total return on the market of equities reduced by the risk-free rate of return. The CAPM specifically accounts for differences in systematic risk (i.e., market risk as

measured by the beta) between an individual firm or group of firms and the entire market of equities. As such, to calculate the CAPM it is necessary to employ firms with traded stocks. In this regard, I performed a CAPM calculation for the Gas Group. In contrast, my Risk Premium approach also considers industry- and company-specific factors because it is not limited to measuring just systematic risk. As a consequence, the Risk Premium approach is more comprehensive than the CAPM. In addition, the Risk Premium approach provides a better measure of the cost of equity because it is founded upon the yields on corporate bonds rather than Treasury bonds.

Q. WHAT BETAS HAVE YOU CONSIDERED IN THE CAPM?

A. For my CAPM analysis, I initially considered the Value Line betas. As shown on page 1 of Attachment NG-PRM-21, the average beta is .86 for the Gas Group.

Q. WHAT BETAS HAVE YOU USED IN THE CAPM DETERMINED COST OF EQUITY?

A. The betas must be reflective of the financial risk associated with the ratesetting capital structure that is measured at book value. Therefore, Value Line betas cannot be used directly in the CAPM, unless those betas are applied to a capital structure measured with market values. To develop a CAPM cost rate applicable to a book value capital structure, the Value Line betas have been unleveraged and releveraged for the common equity ratios using book values using the Hamada formula. This adjustment has been made with the formula:

$$\beta l = \beta u\,[1 + (1 - t)\,D/E + P/E]$$

where ßl = the leveraged beta, ßu = the unleveraged beta, t = income tax rate, D = debt ratio, P = preferred stock ratio, and E = common equity ratio. The betas published by Value Line have been calculated with the market price of stock and therefore are related to the market value capitalization. By using the formula shown above and the capital structure ratios measured at its market values, the beta would become .66 for the Gas Group if it employed no leverage and was 100% equity financed. With the unleveraged beta as a base, I calculated the leveraged beta of 1.02 for the Gas Group associated with book value capital structure. The betas and their corresponding common equity ratios are:

Market Values		Book Values	
Beta	Common Equity Ratio	Beta	Common Equity Ratio
0.86	68.29%	1.02	54.44%

The leveraged beta that I will employ in the CAPM cost of equity is 1.02 for the Gas Group.

Q. WHAT RISK-FREE RATE HAVE YOU USED IN THE CAPM?

A. For reasons explained in Attachment NG-PRM-7, I have employed the yields on 20-year Treasury bonds using both historical and forecast data to match the longer-term horizon associated with the ratesetting process. As shown on pages 2 and 3 of Attachment NG-PRM-21, I provided the historical yields on Treasury notes and bonds. For the twelve months ended October 2007, the average yield on a 20-year

Treasury Bond was 4.94%, as shown on page 3 of that attachment. For the six- and three-months ended October 2007, the yields on 20-year Treasury bonds were 5.02% and 4.89%, respectively. During the twelve-months ended October 2007, the range of the yields on 20-year Treasury bonds was 4.78% to 5.29%. As shown on page 4 of Attachment NG-PRM-21, forecasts published by Blue Chip on January 1, 2008 indicate that the yields on long-term Treasury bonds are expected to be in the range of 4.5% to 4.9% during the next six quarters. The longer term forecasts described previously show that the yields on Treasury bonds will average 5.2% from 2009 through 2013 and 5.3% from 2014 to 2018. Hence, I have used a 4.75% risk-free rate of return for CAPM purposes, which reflects the recent easing of monetary policy by the Federal Reserve Open Market Committee.

Q. WHAT MARKET PREMIUM HAVE YOU USED IN THE CAPM?

A. As developed in Attachment NG-PRM-9, the market premium is developed by averaging historical market performance (i.e., 6.5%) and the forecasts (i.e., 8.28%). For the historically based market premium, I have used the arithmetic mean. The resulting market premium is 7.39% (6.5% + 8.28% = 14.78% ÷ 2), which represents the average market premium using historical and forecast data.

Q. ARE THERE ADJUSTMENTS TO THE CAPM RESULTS THAT ARE NECESSARY TO FULLY REFLECT THE RATE OF RETURN ON COMMON EQUITY?

A. Yes. The literature supports an adjustment relating to the size of the company or portfolio for which the calculation is performed. There would be an understatement of a firm's cost of equity with the CAPM unless the size of a firm is considered. That is to say, as the size of a firm decreases, its risk and, hence, its required return increases. Moreover, in his discussion of the cost of capital, Professor Brigham has indicated that smaller firms have higher capital costs then otherwise similar larger firms (see Fundamentals of Financial Management, fifth edition, page 623). Also, the Fama/French study (see "The Cross-Section of Expected Stock Returns"; The Journal of Finance, June 1992- Any more recent publications that you can cite to that support this point as well?) established that size of a firm helps explain stock returns. In an October 15, 1995 article in Public Utility Fortnightly, entitled "Equity and the Small-Stock Effect," it was demonstrated that the CAPM could understate the cost of equity significantly according to a company's size. Indeed, it was demonstrated in the SBBI Yearbook that the costs of equity for stocks in lower deciles (i.e., smaller stocks) were in excess of those shown by the simple CAPM. In this regard, the Gas Group has an average equity market capitalization of $1,775 million, which would make it a low cap portfolio. The low cap market capitalization would indicate a size premium of 1.76%. Absent such an adjustment, the CAPM would understate the required return. However, for my CAPM analysis,

I have adopted a more conservative size adjustment of 0.97%, which represents the mid-cap adjustment, because the market cap of the Gas Group was near the threshold of the midcap group.

Q. WHAT RESULT HAVE YOU DETERMINED USING THE CAPM?

A. Using the 4.75% risk-free rate of return, the leverage adjusted beta of 1.02 for the Gas Group, the 7.39% market premium, the size adjustment, and the flotation cost adjustment, the following result is indicated.

	Rf	+	*ß*	*x*	(	*Rm-Rf*	)	+	*size*	=	*k*	+	*flot*	=	*K*
Gas Group	4.75%	+	1.02	x	(	7.39%	)	+	0.97%	=	13.26%	+	0.19%	=	13.45%

VIII. COMPARABLE EARNINGS APPROACH

Q. HOW HAVE YOU APPLIED THE COMPARABLE EARNINGS APPROACH IN THIS CASE?

A. The technical aspects of the Comparable Earnings approach are set forth in Attachment NG-PRM-10. Because regulation is a substitute for competitively-determined prices, the returns realized by non-regulated firms with comparable risks to a public utility provide useful insight into a fair rate of return. In order to identify the appropriate return, it is necessary to analyze returns earned (or realized) by other firms within the context of the Comparable Earnings standard. The firms selected for the Comparable Earnings approach should be companies whose prices are not subject to cost-based price ceilings (i.e., non-regulated firms) so that

circularity is avoided. There are two avenues available to implement the Comparable Earnings approach. One method would involve the selection of another industry (or industries) with comparable risks to the public utility in question, and the results for all companies within that industry would serve as a benchmark. The second approach requires the selection of parameters that represent similar risk traits for the public utility and the comparable risk companies. Using this approach, the business lines of the comparable companies become unimportant. The latter approach is preferable with the further qualification that the comparable risk companies exclude regulated firms. As such, this approach to Comparable Earnings avoids the circular reasoning implicit in the use of the achieved earnings/book ratios of other regulated firms. The United States Supreme Court has held that:

> A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties…. The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties. Bluefield Water Works vs. Public Service Commission, 262 U.S. 668 (1923).

Therefore, it is important to identify the returns earned by firms that compete for capital with a public utility. This can be accomplished by analyzing the returns of

non-regulated firms that are subject to the competitive forces of the marketplace.

Q. HOW HAVE YOU IMPLEMENTED THE COMPARABLE EARNINGS APPROACH?

A. To identify the comparable risk companies, the Value Line Investment Survey for Windows was used to screen for firms of comparable risks. The Value Line Investment Survey for Windows includes data on approximately 1700 firms. Excluded from the selection process were companies incorporated in foreign countries and master limited partnerships (MLPs). In order to implement the Comparable Earnings approach, non-regulated companies were selected from the Value Line Investment Survey for Windows that have six categories (see Attachment NG-PRM-10 for definitions) of comparability designed to reflect the risk of the Gas Group. These screening criteria were based upon the range as defined by the rankings of the companies in the Gas Group. The items considered were: Timeliness Rank, Safety Rank, Financial Strength, Price Stability, Value Line betas, and Technical Rank. The identities of the companies comprising the Comparable Earnings group and its associated rankings within the ranges are identified on page 1 of Attachment NG-PRM-22.

Value Line data was relied upon because it provides a comprehensive basis for evaluating the risks of the comparable firms. As to the returns calculated by Value Line for these companies, there is some downward bias in the figures shown on page 2 of Attachment NG-PRM-22, because Value Line computes the returns on

year-end rather than average book value. If average book values had been employed, the rates of return would have been slightly higher. Nevertheless, these are the returns considered by investors when taking positions in these stocks. Because many of the comparability factors, as well as the published returns, are used by investors for selecting stocks, it is appropriate an appropriate database for measuring comparable return opportunities.

Q. WHAT DATA HAVE YOU USED IN YOUR COMPARABLE EARNINGS ANALYSIS?

A. I have used both historical realized returns and forecast returns for non-utility companies. As noted previously, I have not used returns for utility companies in order to avoid the circularity that arises from using regulatory-influenced returns to determine a regulated return. It is appropriate to consider a relatively long measurement period in the Comparable Earnings approach in order to cover conditions over an entire business cycle. A ten-year period (5 historical years and 5 projected years) is sufficient to cover an average business cycle. Unlike the DCF and CAPM, the results of the Comparable Earnings method can be applied directly to the book value capitalization because, the nature of the analysis relates to book value. Hence, Comparable Earnings does not contain the potential misspecification contained in market models when the market capitalization and book value capitalization diverge significantly. The historical rate of return on book common equity was 14.3% using the median value as shown on page 2 of Attachment NG-

PRM-22. The forecast rates of return, as published by Value Line are shown by the 13.5% median values also provided on page 2 of Attachment NG-PRM-22.

Q. WHAT RATE OF RETURN ON COMMON EQUITY HAVE YOU DETERMINED IN THIS CASE USING THE COMPARABLE EARNINGS APPROACH?

A. The average of the historical and forecast median rates of return is:

	Historical	*Forecast*	*Average*
Comparable Earnings Group	14.30%	13.50%	13.90%

IX. CONCLUSION ON RATE OF RETURN

Q. WHAT IS YOUR CONCLUSION CONCERNING THE COMPANY'S COST OF COMMON EQUITY?

A. As discussed previously, it is essential that the Commission consider a variety of techniques to determine the Company's rate of return on common equity because of the limitations/infirmities that are inherent is each method. Based upon the application of the variety of methods and models that I have used, it is my opinion that the reasonable rate of return on common equity is 11.50% for the Company.

Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY?

A. Yes.

Index of Attachments

Attachment NG-PRM-19 - Interest Rates for Investment Grade Public Utility Bonds

Attachment NG-PRM-20 - Long-Term, Year-by-Year Total Returns for the S&P Composite Index, S&P Public Utility Index, and Long-Term Corporate Bonds and Public Utility Bonds

Attachment NG-PRM-21 - Component Inputs for the Capital Market Pricing Model

Attachment NG-PRM-22 - Comparable Earnings Approach

EDUCATIONAL BACKGROUND, BUSINESS EXPERIENCE AND QUALIFICATIONS

I was awarded a degree of Bachelor of Science in Business Administration by Drexel University in 1971. While at Drexel, I participated in the Cooperative Education Program which included employment, for one year, with American Water Works Service Company, Inc., as an internal auditor, where I was involved in the audits of several operating water companies of the American Water Works System and participated in the preparation of annual reports to regulatory agencies and assisted in other general accounting matters.

Upon graduation from Drexel University, I was employed by American Water Works Service Company, Inc., in the Eastern Regional Treasury Department where my duties included preparation of rate case exhibits for submission to regulatory agencies as well as responsibility for various treasury functions of the American Water Works System's thirteen New England operating subsidiaries.

In 1973, I joined the Municipal Financial Services Department of Betz Environmental Engineers, a consulting engineering firm, where I specialized in financial studies for municipal water and wastewater systems.

In 1974, I joined Associated Utility Services, Inc., now known as AUS Consultants. I held various positions with the Utility Services Group of AUS Consultants, concluding my employment there as a Senior Vice President.

In 1994, I formed P. Moul & Associates, an independent financial and regulatory consulting firm. In my capacity as Managing Consultant and for the past twenty-nine years, I have continuously studied the rate of return requirements for cost of service regulated firms. In

this regard, I have supervised the preparation of rate of return studies that were employed in connection with my testimony and in the past for other individuals. I have presented direct testimony on the subject of fair rate of return, evaluated rate of return testimony of other witnesses, and presented rebuttal testimony.

My studies and prepared direct testimony have been presented before thirty (30) federal, state and municipal regulatory commissions, including: the Federal Energy Regulatory Commission; state public utility commissions in Alabama, Connecticut, Delaware, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, and West Virginia; and the Philadelphia Gas Commission. My testimony has been offered in over 200 rate cases involving electric power, natural gas distribution and transmission, resource recovery, solid waste collection and disposal, telephone, wastewater, and water service utility companies. While my testimony has involved principally fair rate of return and financial matters, I have also testified on capital allocations, capital recovery, cash working capital, income taxes, factoring of accounts receivable, and take-or-pay expense recovery. My testimony has been offered on behalf of municipal and investor-owned public utilities and for the staff of a regulatory commission. I also testified at an Executive Session of the State of New Jersey Commission of Investigation concerning the BPU regulation of solid waste collection and disposal.

I was a co-author of a verified statement submitted to the Interstate Commerce Commission concerning the 1983 Railroad Cost of Capital (Ex Parte No. 452). I was also co-

author of comments submitted to the Federal Energy Regulatory Commission regarding the Generic Determination of Rate of Return on Common Equity for Public Utilities in 1985, 1986 and 1987 (Docket Nos. RM85-19-000, RM86-12-000, RM87-35-000 and RM88-25-000). Further, I have been the consultant to the New York Chapter of the National Association of Water Companies, which represented the water utility group in the Proceeding on Motion of the Commission to Consider Financial Regulatory Policies for New York Utilities (Case 91-M-0509). I have also submitted comments to the Federal Energy Regulatory Commission in its Notice of Proposed Rulemaking (Docket No. RM99-2-000) concerning Regional Transmission Organizations and on behalf of the Edison Electric Institute in its intervention in the case of Southern California Edison Company (Docket No. ER97-2355-000).

In late 1978, I arranged for the private placement of bonds on behalf of an investor-owned public utility. I have assisted in the preparation of a report to the Delaware Public Service Commission relative to the operations of the Lincoln and Ellendale Electric Company. I was also engaged by the Delaware P.S.C. to review and report on the proposed financing and disposition of certain assets of Sussex Shores Water Company (P.S.C. Docket Nos. 24-79 and 47-79). I was a co-author of a Report on Proposed Mandatory Solid Waste Collection Ordinance prepared for the Board of County Commissioners of Collier County, Florida.

I have been a consultant to the Bucks County Water and Sewer Authority concerning rates and charges for wholesale contract service with the City of Philadelphia. My municipal consulting experience also included an assignment for Baltimore County, Maryland, regarding the City/County Water Agreement for Metropolitan District customers (Circuit Court for Baltimore County in Case 34/153/87-CSP-2636).

I am a member of the Society of Utility and Regulatory Financial Analysis (formerly the National Society of Rate of Return Analysts) and have attended several Financial Forums sponsored by the Society. I attended the first National Regulatory Conference at the Marshall-Wythe School of Law, College of William and Mary. I also attended an Executive Seminar sponsored by the Colgate Darden Graduate Business School of the University of Virginia concerning Regulated Utility Cost of Equity and the Capital Asset Pricing Model. In October 1984, I attended a Standard & Poor's Seminar on the Approach to Municipal Utility Ratings, and in May 1985, I attended an S&P Seminar on Telecommunications Ratings.

My lecture and speaking engagements include:

Date	Occasion	Sponsor
April 2006	Thirty-eighth Financial Forum	Society of Utility & Regulatory Financial Analysts
April 2001	Thirty-third Financial Forum	Society of Utility & Regulatory Financial Analysts
December 2000	Pennsylvania Public Utility Law Conference: Non-traditional Players in the Water Industry	Pennsylvania Bar Institute
July 2000	EEI Member Workshop Developing Incentives Rates: Application and Problems	Edison Electric Institute
February 2000	The Sixth Annual FERC Briefing	Exnet and Bruder, Gentile & Marcoux, LLP
March 1994	Seventh Annual Proceeding	Electric Utility Business Environment Conf.
May 1993	Financial School	New England Gas Assoc.
April 1993	Twenty-Fifth Financial Forum	National Society of Rate of Return Analysts
June 1992	Rate and Charges Subcommittee Annual Conference	American Water Works Association
May 1992	Rates School	New England Gas Assoc.
October 1989	Seventeenth Annual	Water Committee of the

	Eastern Utility Rate Seminar	National Association of Regulatory Utility Commissioners Florida Public Service Commission and University of Utah
October 1988	Sixteenth Annual Eastern Utility Rate Seminar	Water Committee of the National Association of Regulatory Utility Commissioners, Florida Public Service Commission and University of Utah
May 1988	Twentieth Financial Forum	National Society of Rate of Return Analysts
October 1987	Fifteenth Annual Eastern Utility Rate Seminar	Water Committee of the National Association of Regulatory Utility Commissioners, Florida Public Service Commission and University of Utah
September 1987	Rate Committee Meeting	American Gas Association
May 1987	Pennsylvania Chapter annual meeting	National Association of Water Companies
October 1986	Eighteenth Financial Forum	National Society of Rate of Return
October 1984	Fifth National on Utility Ratemaking Fundamentals	American Bar Association
March 1984	Management Seminar	New York State Telephone Association
February 1983	The Cost of Capital Seminar	Temple University, School of Business Admin.
May 1982	A Seminar on Regulation and The Cost of Capital	New Mexico State University, Center for Business Research and Services
October 1979	Economics of Regulation	Brown University

RATESETTING PRINCIPLES

Traditional cost of service regulation, as implemented by a regulatory agency engaged in ratesetting, such as the Commission, serves as a substitute for competition. In setting rates, a regulatory agency must carefully consider the public's interest in reasonably priced, as well as safe and reliable, service. The level of rates must also provide the public utility and its investors with an opportunity to earn a rate of return for the public utility and its investors that is commensurate with the risk to which the invested capital is exposed so that the public utility has access to the capital required to meet its service responsibilities to its customers. Without an opportunity to earn a fair rate of return, a public utility will be unable to attract sufficient capital required to meet its responsibilities over time.

It is important to remember that regulated firms must compete for capital in a global market with non-regulated firms, as well as municipal, state and federal governments. Traditionally, a public utility has been responsible for providing a particular type of service to its customers within a specific market area. Although this relationship with customers has been changing, a regulated utility remains quite different from a non-regulated firm which is free to enter and exit competitive markets in accordance with available business opportunities.

As established by the landmark Bluefield and Hope cases,[1] several tests have been articulated through which the regulator can determine the fairness or reasonableness of the rate of return. These tests include a determination of whether the rate of return is (i) similar to that of other financially sound businesses having similar or comparable risks, (ii) sufficient to ensure confidence in the financial integrity of the public utility, and (iii) adequate to maintain

1 Bluefield Water Works & Improvement Co. v. P.S.C. of West Virginia, 262 U.S. 679 (1923) and F.P.C. v. Hope Natural Gas Co., 320 U.S. 591 (1944).

and support the credit of the utility, thereby enabling it to attract, on a reasonable cost basis, the funds necessary to satisfy its capital requirements so that it can meet the obligation to provide adequate and reliable service to the public.

A fair rate of return must not only provide the utility with the ability to attract new capital, but it must also be fair to existing investors. An appropriate rate of return which may have been reasonable at one point in time may become too high or too low at a subsequent point in time, based upon changing business risks, economic conditions and alternative investment opportunities. When applying the standards of a fair rate of return, it must be recognized that the end result must provide for the payment of interest on the company's debt, the payment of dividends on the company's stock, the recovery of costs associated with securing capital, the maintenance of reasonable credit quality for the company, and support of the company's financial condition, which today would include those measures of financial performance in the areas of interest coverage and adequate cash flow derived from a reasonable level of earnings.

EVALUATION OF RISK

The rate of return required by investors is directly linked to the perceived level of risk. The greater the risk of an investment, the higher is the required rate of return necessary to compensate for that risk, all else being equal. Because investors will seek the highest rate of return available considering the risk involved, the rate of return must at least equal the investor-required, market-determined cost of capital if public utilities are to attract the necessary investment capital on reasonable terms.

In the measurement of the cost of capital, it is necessary to assess the risk of a firm. The level of risk for a firm is often defined as the uncertainty of achieving expected performance, and is sometimes viewed as a probability distribution of possible outcomes. Hence, if the uncertainty of achieving an expected outcome is high, the risk is also high. As a consequence, high risk firms must offer investors higher returns than low risk firms, which pay less to attract capital from investors. This is because the level of uncertainty, or risk of not realizing expected returns, establishes the compensation required by investors in the capital markets. Of course, the risk of a firm must also be considered in the context of its ability to actually experience adequate earnings which conform with a fair rate of return. Thus, if there is a high probability that a firm will not perform well due to fundamentally poor market conditions, investors will demand a higher return.

The investment risk of a firm is comprised of its business risk and financial risk. Business risk is all risk other than financial risk, and is sometimes defined as the staying power of the market demand for a firm's product or service and the resulting inherent uncertainty of realizing expected pre-tax returns on the firm's assets. Business risk encompasses all operating

factors, e.g., productivity, competition, management ability, etc. that bear upon the expected pre-tax operating income attributed to the fundamental nature of a firm's business. Financial risk results from a firm's use of borrowed funds (or similar sources of capital with fixed payments) in its capital structure, i.e., financial leverage. Thus, if a firm did not employ financial leverage by borrowing any capital, its investment risk would be represented by its business risk.

It is important to note that in evaluating the risk of regulated companies, financial leverage cannot be considered in the same context as it is for non-regulated companies. Financial leverage has a different meaning for regulated firms than for non-regulated companies. When rates are set for regulated public utilities, the cost of service formula gives the benefits of financial leverage to consumers in the form of lower revenue requirements, since the cost of borrowed funds is generally lower than the cost of equity invested in the company. For non-regulated companies, all benefits of financial leverage are retained by the common stockholder. Although retaining none of the benefits, regulated firms bear the risk of financial leverage. Therefore, a regulated firm's rate of return on common equity must recognize the greater financial risk shown by the higher leverage typically employed by public utilities.

Although no single index or group of indices can precisely quantify the relative investment risk of a firm, financial analysts use a variety of indicators to assess that risk. For example, the creditworthiness of a firm is revealed by its bond ratings. If the stock is traded, the price-earnings multiple, dividend yield, and beta coefficients (a statistical measure of a stock's relative volatility to the rest of the market) provide some gauge of overall risk. Other

indicators, which are reflective of business risk, include the variability of the rate of return on equity, which is indicative of the uncertainty of actually achieving the expected earnings; operating ratios (the percentage of revenues consumed by operating expenses, depreciation, and taxes other than income tax), which are indicative of profitability; the quality of earnings, which considers the degree to which earnings are the product of accounting principles or cost deferrals; and the level of internally generated funds. Similarly, the proportion of senior capital in a company's capitalization is the measure of financial risk which is often analyzed in the context of the equity ratio (i.e., the complement of the debt ratio).

COST OF EQUITY--GENERAL APPROACH

Through a fundamental financial analysis, the relative risk of a firm must be established prior to the determination of its cost of equity. Any rate of return recommendation which lacks such a basis will inevitably fail to provide a utility with a fair rate of return except by coincidence. With a fundamental risk analysis as a foundation, standard financial models can be employed by using informed judgment. The methods which have been employed to measure the cost of equity include: the Discounted Cash Flow ("DCF") model, the Risk Premium ("RP") approach, the Capital Asset Pricing Model ("CAPM") and the Comparable Earnings ("CE") approach.

The traditional DCF model, while useful in providing some insight into the cost of equity, is not an approach that should be relied upon exclusively. The divergence of stock prices from company-specific fundamentals can provide a misleading cost of equity calculation. As reported in The Wall Street Journal on June 6, 1991, a statistical study published by Goldman Sachs indicated that only 35% of stock price growth in the 1980's could be attributed to earnings and interest rates. Further, 38% of the rise in stock prices during the 1980's was attributed to unknown factors. The Goldman Sachs study highlights the serious limitations of a model, such as DCF, which is founded upon identification of specific variables to explain stock price growth. That is to say, when stock price growth exceeds growth in a company's earnings per share, models such as DCF will misspecify investor expected returns which are comprised of capital gains, as well as dividend receipts. As such, a combination of methods should be used to measure the cost of equity.

The Risk Premium analysis is founded upon the prospective cost of long-term debt, i.e., the yield that the public utility must offer to raise long-term debt capital directly from investors. To that yield must be added a risk premium in recognition of the greater risk of common equity over debt. This additional risk is, of course, attributable to the fact that the payment of interest and principal to creditors has priority over the payment of dividends and return of capital to equity investors. Hence, equity investors require a higher rate of return than the yield on long-term corporate bonds.

The CAPM is a model not unlike the traditional Risk Premium. The CAPM employs the yield on a risk-free interest-bearing obligation, plus a premium as compensation for risk. Aside from the reliance on the risk-free rate of return, the CAPM gives specific quantification to systematic (or market) risk as measured by beta.

The Comparable Earnings approach measures the returns expected/experienced by other non-regulated firms and has been used extensively in rate of return analysis for over a half century. However, its popularity diminished in the 1970s and 1980s with the popularization of market-based models. Recently, there has been renewed interest in this approach. Indeed, the financial community has expressed the view that the regulatory process must consider the returns that are being achieved in the non-regulated sector so that public utilities can compete effectively in the capital markets. With additional competition being introduced throughout the traditionally regulated public utility industry, returns expected to be realized by non-regulated firms have become increasingly relevant in the ratesetting process. The Comparable Earnings approach considers directly those requirements, and it fits the established standards for a fair

rate of return set forth in the landmark decisions on the issue of rate of return. These decisions require that a fair return for a utility must be equal to that earned by firms of comparable risk.

NG-PRM-5

DISCOUNTED CASH FLOW ANALYSIS

Discounted Cash Flow ("DCF") theory seeks to explain the value of an economic or financial asset as the present value of future expected cash flows discounted at the appropriate risk-adjusted rate of return. Thus, if $100 is to be received in a single payment 10 years subsequent to the acquisition of an asset, and the appropriate risk-related interest rate is 8%, the present value of the asset would be $46.32 (Value = $100 ÷ $(1.08)^{10}$) arising from the discounted future cash flow. Conversely, knowing the present $46.32 price of an asset (where price = value), the $100 future expected cash flow to be received 10 years hence shows an 8% annual rate of return implicit in the price and future cash flows expected to be received.

In its simplest form, the DCF theory considers the number of years from which the cash flow will be derived and the annual compound interest rate which reflects the risk or uncertainty associated with the cash flows. It is appropriate to reiterate that the dollar values to be discounted are future cash flows.

DCF theory is flexible and can be used to estimate value (or price) or the annual required rate of return under a wide variety of conditions. The theory underlying the DCF methodology can be easily illustrated by utilizing the investment horizon associated with a preferred stock not having an annual sinking fund provision. In this case, the investment horizon is infinite, which reflects the perpetuity of a preferred stock. If *P* represents price, *Kp* is the required rate of return on a preferred stock, and *D* is the annual dividend (*P* and *D* with time subscripts), the value of a preferred share is equal to the present value of the dividends to

be received in the future discounted at the appropriate risk-adjusted interest rate, *Kp*. In this circumstance:

$$P_0 = \frac{D_1}{(1 + Kp\ )} + \frac{D_2}{(1 + Kp\ )^2} + \frac{D_3}{(1 + Kp\ )^3} + \ldots + \frac{D_n}{(1 + Kp\ )^n}$$

If $D_1 = D_2 = D_3 = \ldots D_n$ as is the case for preferred stock, and *n* approaches infinity, as is the case for non-callable preferred stock without a sinking fund, then this equation reduces to:

$$P_0 = \frac{D_1}{Kp}$$

This equation can be used to solve for the annual rate of return on a preferred stock when the current price and subsequent annual dividends are known. For example, with D_1 = \$1.00, and P_0 = \$10, then *Kp* = \$1.00 ÷ \$10, or 10%.

The dividend discount equation, first shown, is the generic DCF valuation model for all equities, both preferred and common. While preferred stock generally pays a constant dividend, permitting the simplification subsequently noted, common stock dividends are not constant. Therefore, absent some other simplifying condition, it is necessary to rely upon the generic form of the DCF. If, however, it is assumed that D_1, D_2, D_3, **…**D_n are systematically related to one another by a constant growth rate *(g)*, so that $D_0\ (1 + g) = D_1$, $D_1\ (1 + g) = D_2$, $D_2\ (1 + g) = D_3$ and so on approaching infinity, and if *Ks* (the required rate of return on a common stock)

$$P_0 = \frac{D_1}{Ks - g} \quad or \quad P_0 = \frac{D_0(1 + g)}{Ks - g}$$

is greater than *g*, then the DCF equation can be reduced to:

which is the periodic form of the "Gordon" model.[1] Proof of the DCF equation is found in all modern basic finance textbooks. This DCF equation can be easily solved as:

$$Ks = \frac{D_0 (1 + g)}{P_0} + g$$

which is the periodic form of the Gordon Model commonly applied in estimating equity rates of return in rate cases. When used for this purpose, *Ks* is the annual rate of return on common equity demanded by investors to induce them to hold a firm's common stock. Therefore, the variables D_0, P_0 and *g* must be estimated in the context of the market for equities, so that the rate of return, which a public utility is permitted the opportunity to earn, has meaning and reflects the investor-required cost rate.

Application of the Gordon model with market derived variables is straightforward. For example, using the most recent prior annualized dividend (D_0) of $0.80, the current price (P_0) of $10.00, and the investor expected dividend growth rate *(g)* of 5%, the solution of the DCF formula provides a 13.4% rate of return. The dividend yield component in this instance is 8.4%, and the capital gain component is 5%, which together represent the total 13.4% annual rate of return required by investors. The capital gain component of the total return may be calculated with two adjacent future year prices. For example, in the eleventh year of the

1 Although the popular application of the DCF model is often attributed to the work of Myron J. Gordon in the mid-1950's, J. B. Williams exposited the DCF model in its present form nearly two decades earlier.

holding period, the price per share would be $17.10 as compared with the price per share of $16.29 in the tenth year which demonstrates the 5% annual capital gain yield.

Some DCF devotees believe that it is more appropriate to estimate the required return on equity with a model which permits the use of multiple growth rates. This may be a plausible approach to DCF, where investors expect different dividend growth rates in the near term and long run. If two growth rates, one near term and one long-run, are to be used in the context of a price (P_0) of $10.00, a dividend (D_0) of $0.80, a near-term growth rate of 5.5%, and a long-run expected growth rate of 5.0% beginning at year 6, the required rate of return is 13.57% solved with a computer by iteration.

Dividend Yield

The historical annual dividend yield for the Gas Group is shown on Attachment NG-PRM-13. The 2002-2006 five-year average dividend yield was 4.2% for the Gas Group. The monthly dividend yields for the twelve months ending in December 2007 are shown graphically on Attachment NG-PRM-15. These dividend yields reflect an adjustment to the month-end closing prices to remove the pro rata accumulation of the quarterly dividend amount since the last ex-dividend date.

The ex-dividend date usually occurs two business days before the record date of the dividend (i.e., the date by which a shareholder must own the shares to be entitled to the dividend payment--usually about two to three weeks prior to the actual payment). During a quarter (here defined as 91 days), the price of a stock moves up ratably by the dividend amount as the ex-dividend date approaches. The stock's price then falls by the amount of the dividend

on the ex-dividend date. Therefore, it is necessary to calculate the fraction of the quarterly dividend since the time of the last ex-dividend date and to remove that amount from the price. This adjustment reflects normal recurring pricing of stocks in the market, and establishes a price that will reflect the true yield on a stock.

A six-month average dividend yield has been used to recognize the prospective orientation of the ratesetting process as explained in the direct testimony. For the purpose of a DCF calculation, the average dividend yields must be adjusted to reflect the prospective nature of the dividend payments, i.e., the higher expected dividends for the future rather than the recent dividend payment annualized. An adjustment to the dividend yield component, when computed with annualized dividends, is required based upon investor expectation of quarterly dividend increases.

The procedure to adjust the average dividend yield for the expectation of a dividend increase during the initial investment period will be at a rate of one-half the growth component, developed below. The DCF equation, showing the quarterly dividend payments as D_0, may be stated in this fashion:

$$K = \frac{D_0 (1+g)^0 + D_0 (1+g)^0 + D_0 (1+g)^1 + D_0 (1+g)^1}{P_0} + g$$

The adjustment factor, based upon one-half the expected growth rate developed in my direct testimony, is 2.625% (5.25% x .5) for the Gas Group, which assumes that two dividend payments will be at the expected higher rate during the initial investment period. Using the six-

month average dividend yield as a base, the prospective (forward) dividend yield is 3.85% (3.75% x 1.02625) for the Gas Group.

Another DCF model that reflects the discrete growth in the quarterly dividend *(D_0)* is as follows:

$$K = \frac{D_0 (1+g)^{.25} + D_0 (1+g)^{.50} + D_0 (1+g)^{.75} + D_0 (1+g)^{1.00}}{P_0} + g$$

This procedure confirms the reasonableness of the forward dividend yield previously calculated. The quarterly discrete adjustment provides a dividend yield of 3.87% (3.75% x 1.03260) for the Gas Group. The use of an adjustment is required for the periodic form of the DCF in order to properly recognize that dividends grow on a discrete basis.

In either of the preceding DCF dividend yield adjustments, there is no recognition for the compound returns attributed to the quarterly dividend payments. Investors have the opportunity to reinvest quarterly dividend receipts. Recognizing the compounding of the

$$k = \left[\left(1 + \frac{D_0}{P_0} \right)^4 - 1 \right] + g$$

periodic quarterly dividend payments *(D_0)*, results in a third DCF formulation:

This DCF equation provides no further recognition of growth in the quarterly dividend. Combining discrete quarterly dividend growth with quarterly compounding would provide the following DCF formulation, stating the quarterly dividend payments *(D_0)*:

$$k = \left[\left(1 + \frac{D_0 (1+g)^{.25}}{P_0} \right)^4 - 1 \right] + g$$

A compounding of the quarterly dividend yield provides another procedure to recognize the necessity for an adjusted dividend yield. The unadjusted average quarterly dividend yield was 0.9375% (3.75% ÷ 4) for the Gas Group. The compound dividend yield would be 3.85% (1.009496^4-1) for the Gas Group, recognizing quarterly dividend payments in a forward-looking manner. These dividend yields conform with investors' expectations in the context of reinvestment of their cash dividend.

For the Gas Group, a 3.86% forward-looking dividend yield is the average (3.85% + 3.87% + 3.85% = 11.57% ÷ 3) of the adjusted dividend yield using the form $D_0/P_0\ (1+.5g)$, the dividend yield recognizing discrete quarterly growth, and the quarterly compound dividend yield with discrete quarterly growth.

Growth Rate

If viewed in its infinite form, the DCF model is represented by the discounted value of an endless stream of growing dividends. It would, however, require 100 years of future dividend payments so that the discounted value of those payments would equate to the present

price so that the discount rate and the rate of return shown by the simplified Gordon form of the DCF model would be about the same. A century of dividend receipts represents an unrealistic investment horizon from almost any perspective. Because stocks are not held by investors forever, the growth in the share value (i.e., capital appreciation, or capital gains yield) is most relevant to investors' total return expectations. Hence, investor expected returns in the equity market are provided by capital appreciation of the investment as well as receipt of dividends. As such, the sale price of a stock can be viewed as a liquidating dividend which can be discounted along with the annual dividend receipts during the investment holding period to arrive at the investor expected return.

In its constant growth form, the DCF assumes that with a constant return on book common equity and constant dividend payout ratio, a firm's earnings per share, dividends per share and book value per share will grow at the same constant rate, absent any external financing by a firm. Because these constant growth assumptions do not actually prevail in the capital markets, the capital appreciation potential of an equity investment is best measured by the expected growth in earnings per share. Since the traditional form of the DCF assumes no change in the price-earnings multiple, the value of a firm's equity will grow at the same rate as earnings per share. Hence, the capital gains yield is best measured by earnings per share growth using company-specific variables.

Investors consider both historical and projected data in the context of the expected growth rate for a firm. An investor can compute historical growth rates using compound growth rates or growth rate trend lines. Otherwise, an investor can rely upon published growth

rates as provided in widely-circulated, influential publications. However, a traditional constant growth DCF analysis that is limited to such inputs suffers from the assumption of no change in the price-earnings multiple, i.e., that the value of a firm's equity will grow at the same rate as earnings. Some of the factors which actually contribute to investors' expectations of earnings growth and which should be considered in assessing those expectations, are: (i) the earnings rate on existing equity, (ii) the portion of earnings not paid out in dividends, (iii) sales of additional common equity, (iv) reacquisition of common stock previously issued, (v) changes in financial leverage, (vi) acquisitions of new business opportunities, (vii) profitable liquidation of assets, and (viii) repositioning of existing assets. The realities of the equity market regarding total return expectations, however, also reflect factors other than these inputs. Therefore, the DCF model contains overly restrictive limitations when the growth component is stated in terms of earnings per share (the basis for the capital gains yield) or dividends per share (the basis for the infinite dividend discount model). In these situations, there is inadequate recognition of the capital gains yields arising from stock price growth which could exceed earnings or dividends growth.

To assess the growth component of the DCF, analysts' projections of future growth influence investor expectations as explained above. One influential publication is The Value Line Investment Survey which contains estimated future projections of growth. The Value Line Investment Survey provides growth estimates which are stated within a common economic environment for the purpose of measuring relative growth potential. The basis for these projections is the Value Line 3 to 5 year hypothetical economy. The Value Line

hypothetical economic environment is represented by components and subcomponents of the National Income Accounts which reflect in the aggregate assumptions concerning the unemployment rate, manpower productivity, price inflation, corporate income tax rate, high-grade corporate bond interest rates, and Fed policies. Individual estimates begin with the correlation of sales, earnings and dividends of a company to appropriate components or subcomponents of the future National Income Accounts. These calculations provide a consistent basis for the published forecasts. Value Line's evaluation of a specific company's future prospects are considered in the context of specific operating characteristics that influence the published projections. Of particular importance for regulated firms, Value Line considers the regulatory quality, rates of return recently authorized, the historic ability of the firm to actually experience the authorized rates of return, the firm's budgeted capital spending, the firm's financing forecast, and the dividend payout ratio. The wide circulation of this source and frequent reference to Value Line in financial circles indicate that this publication has an influence on investor judgment with regard to expectations for the future.

There are other sources of earnings growth forecasts. One of these sources is the Institutional Brokers Estimate System ("IBES"). The IBES service provides data on consensus earnings per share forecasts and five-year earnings growth rate estimates. The publisher of IBES has been purchased by Thomson/First Call. The IBES forecasts have been integrated into the First Call consensus growth forecasts. The earnings estimates are obtained from financial analysts at brokerage research departments and from institutions whose securities analysts are projecting earnings for companies in the First Call universe of companies. Other services that

tabulate earnings forecasts and publish them are Zacks Investment Research and Market Guide (which is provided over the Internet by Reuters). As with the IBES/First Call forecasts, Zacks and Reuters/Market Guide provide consensus forecasts collected from analysts for most publically traded companies.

In each of these publications, forecasts of earnings per share for the current and subsequent year receive prominent coverage. That is to say, IBES/First Call, Zacks, Reuters/Market Guide, and Value Line show estimates of current-year earnings and projections for the next year. While the DCF model typically focuses upon long-run estimates of growth, stock prices are clearly influenced by current and near-term earnings prospects. Therefore, the near-term earnings per share growth rates should also be factored into a growth rate determination.

Although forecasts of future performance are investor influencing[2], equity investors may also rely upon the observations of past performance. Investors' expectations of future growth rates may be determined, in part, by an analysis of historical growth rates. It is apparent that any serious investor would advise himself/herself of historical performance prior to taking an investment position in a firm. Earnings per share and dividends per share represent the principal financial variables which influence investor growth expectations.

Other financial variables are sometimes considered in rate case proceedings. For example, a company's internal growth rate, derived from the return rate on book common equity and the related retention ratio, is sometimes considered. This growth rate measure is

2 As shown in a National Bureau of Economic Research monograph by John G. Cragg and Burton G. Malkiel, Expectations and the Structure of Share Prices, University of Chicago Press 1982.

represented by the Value Line forecast "*B*x*R*" shown on Attachment NG-PRM-17. Internal growth rates are often used as a proxy for book value growth. Unfortunately, this measure of growth is often not reflective of investor-expected growth. This is especially important when there is an indication of a prospective change in dividend payout ratio, earned return on book common equity, change in market-to-book ratios or other fundamental changes in the character of the business. Nevertheless, I have also shown the historical and projected growth rates in book value per share and internal growth rates.

Leverage Adjustment

As noted previously, the divergence of stock prices from book values creates a conflict within the DCF model when the results of a market-derived cost of equity are applied to the common equity account measured at book value in the ratesetting context. This is the situation today where the market price of stock exceeds its book value for most companies. This divergence of price and book value also creates a financial risk difference, whereby the capitalization of a utility measured at its market value contains relatively less debt and more equity than the capitalization measured at its book value. It is a well-accepted fact of financial theory that a relatively higher proportion of equity in the capitalization has less financial risk than another capital structure more heavily weighted with debt. This is the situation for the Gas Group where the market value of its capitalization contains more equity than is shown by the book capitalization. The following comparison demonstrates this situation where the market capitalization is developed by taking the "Fair Value of Financial Instruments" (Disclosures about Fair Value of Financial Instruments -- Statement of Financial Accounting Standards

("FAS") No. 107) as shown in the annual report for these companies and the market value of the common equity using the price of stock. The comparison of capital structure ratios is:

Gas Group	Capitalization at Market Value (Fair Value)	Capitalization at Book Value (Carrying Amounts)
Long-term Debt	31.52%	45.29%
Preferred Stock	0.19%	0.26%
Common Equity	68.29%	54.44%
Total	100.00%	100.00%

With regard to the capital structure ratios represented by the carrying amounts shown above, there are some variances from the ratios shown on Attachment NG-PRM-13. These variances arise from the use of balance sheet values in computing the capital structure ratios shown on Attachment NG-PRM-13 and the use of the Carrying Amounts of the Financial Instruments according to FAS 107 (the Carrying Amounts were used in the table shown above to be comparable to the Fair Value amounts used in the comparison calculations).

With the capital ratios calculated above, it is necessary to first calculate the cost of equity for a firm without any leverage. The cost of equity for an unleveraged firm using the capital structure ratios calculated with market values is:

$$ku = ke - (((ku - i)\ 1\text{-}t)\ D / E) - (ku - d)\ P / E$$

$$8.43\% = 9.11\% - (((8.43\%-6.18\%)\ .65)\ 31.52\%/68.29\%) - (8.43\% - 6.12\%)\ 0.19\%/68.29\%$$

where ku = cost of equity for an all-equity firm, ke = market determined cost equity, i = cost of debt[3], d = dividend rate on preferred stock[4], D = debt ratio, P = preferred stock ratio, and E =

3 The cost of debt is the six-month average yield on Moody's A rated public utility bonds.

common equity ratio. The formula shown above indicates that the cost of equity for a firm with 100% equity is 8.43% using the market value of the Gas Group's capitalization. Having determined that the cost of equity is 8.43% for a firm with 100% equity, the rate of return on common equity associated with the book value capital structure is:

ke = ku + (((ku - i) 1-t) D / E) + (ku - d) P / E

9.65% =8.43%+ (((8.43%-6.18%) .65) 45.29%/54.44%) + (8.43%-6.12%) 0.26%/54.44%

4 The cost of preferred is the six-month average yield on Moody's "a" rated preferred stock.

FLOTATION COST ADJUSTMENT

The rate of return on common equity must be high enough to avoid dilution when additional common equity is issued. In this regard, the rate of return on book common equity for public utilities requires recognition of specific factors other than just the market-determined cost of equity. A market price of common stock above book value is necessary to attract future capital on reasonable terms in competition with other seekers of equity capital. Non-regulated companies traditionally have experienced common stock prices consistently above book value. For a public utility to be competitive in the capital markets, similar recognition should be provided, given the understated value of net plant investment which is represented by historical costs much lower than current cost. Moreover, the market value of a public utility stock must be above book value to provide recognition of market pressure, issuance and selling expenses which reduce the net proceeds realized from the sale of new shares of common stock. A market price of stock above book value will maintain the financial integrity of shares previously issued and is necessary to avoid dilution when new shares are offered.

The rate of return on common equity should provide for the underwriting discount and company issuance expenses associated with the sale of new common stock. It is the net proceeds, after payment of these costs that are available to the company, because the issuance costs are paid from the initial offering price to the public. Market pressure occurs when the news of an impending issue of new common shares impacts the pre-offering price of stock. The stock price often declines because of the prospect of an increase in the supply of shares. The difficulty encountered in measuring market pressure relates to the time frame

considered, general market conditions, and management action during the offering period. An indication of negative market pressure could be the product of the techniques employed to measure pressure and not the prospect of an additional supply of shares related to the new issue.

Even in the situation where a company will not issue common stock during the near term, the flotation cost adjustment factor should be applied to the common equity cost rate. A public utility must be in a competitive capital attraction posture at all times. To deny recognition of a market value of equity above book value would be discriminatory when other comparable companies receive an allowance in this regard. Moreover, to reduce the return rate on common equity by failing to recognize this factor would likewise result in a company being less competitive in the bond market, because a lower resulting overall rate of return would provide less competitive fixed-charge coverage. It cannot be said that a public utility's stock price already considers an allowance for flotation costs. This is because investors in either fixed-income bonds or common stocks seek their required rate of return by reference to alternative investment opportunities, and are not concerned with the issuance costs incurred by a firm borrowing long-term debt or issuing common equity.

Historical data concerning issuance and selling expenses (excluding market pressure) is shown on Attachment NG-PRM-18. To adjust for the cost of raising new common equity capital, the rate of return on common equity should recognize an appropriate multiple in order to allow for a market price of stock above book value. This would provide recognition for flotation costs, which are shown to be 3.9% for public offerings of common stocks by gas companies from 2002 to 2006. Because these costs are not recovered elsewhere, they must be

recognized in the rate of return. Since I apply the flotation cost to the entire cost of equity, I have only used a modification factor of 1.02 which is applied to the unadjusted DCF-measure of the cost of equity to cover issuance expense. If the modification factor were applied to only a portion of the cost of equity, such as just the dividend yield, then a higher factor would be necessary.

INTEREST RATES

Interest rates can be viewed in their traditional nominal terms (i.e., the stated rate of interest) and in real terms (i.e., the stated rate of interest less the expected rate of inflation). Absent consideration of inflation, the real rate of interest is determined generally by supply factors which are influenced by investors' willingness to forego current consumption (i.e., to save) and demand factors that are influenced by the opportunities to derive income from productive investments. Added to the real rate of interest is compensation required by investors for the inflationary impact of the declining purchasing power of their income received in the future. While interest rates are clearly influenced by the changing annual rate of inflation, it is important to note that the expected rate of inflation that is reflected in current interest rates, may be quite different than the prevailing rate of inflation.

Rates of interest also vary by the type of interest bearing instrument. Investors require compensation for the risk associated with the term of the investment and the risk of default. The risk associated with the term of the investment is usually shown by the yield curve, i.e., the difference in rates across maturities. The typical structure is represented by a positive yield curve which provides progressively higher interest rates as the maturities are lengthened. Flat (i.e., relatively level rates across maturities) or inverted (i.e., higher short-term rates than long-term rates) yield curves occur less frequently.

The risk of default is typically associated with the creditworthiness of the borrower. Differences in interest rates can be traced to the credit quality ratings assigned by the bond rating agencies, such as Moody's Investors Service, Inc. and Standard & Poor's Corporation. Obligations of the United States Treasury are usually considered to be free of default risk, and

hence reflect only the real rate of interest, compensation for expected inflation, and maturity risk. The Treasury has been issuing inflation-indexed notes which automatically provide compensation to investors for future inflation, thereby providing a lower current yield on these issues.

Interest Rate Environment

Federal Reserve Board ("Fed") policy actions which impact directly short-term interest rates also substantially affect investor sentiment in long-term fixed-income securities markets. In this regard, the Fed has often pursued policies designed to build investor confidence in the fixed-income securities market. Formative Fed policy has had a long history, as exemplified by the historic 1951 Treasury-Federal Reserve Accord, and more recently, deregulation within the financial system which increased the level and volatility of interest rates. The Fed has indicated that it will follow a monetary policy designed to promote non-inflationary economic growth.

As background to the recent levels of interest rates, history shows that the Open Market Committee of the Federal Reserve board ("FOMC") began a series of moves toward lower short-term interest rates in mid-1990 -- at the outset of the previous recession. Monetary policy was influenced at that time by (i) steps taken to reduce the federal budget deficit, (ii) slowing economic growth, (iii) rising unemployment, and (iv) measures intended to avoid a credit crunch. Thereafter, the Federal government initiated several bold proposals to deal with future borrowings by the Treasury. With lower expected federal budget deficits and reduced Treasury borrowings, together with limitations on the supply of new 30-year Treasury bonds, long-term interest rates declined to a twenty-year low, reaching a trough of 5.78% in October 1993.

On February 4, 1994, the FOMC began a series of increases in the Fed Funds rate (i.e., the interest rate on excess overnight bank reserves). The initial increase represented the first rise in short-term interest rates in five years. The series of seven increases doubled the Fed Funds rate to 6%. The increases in short-term interest rates also caused long-term rates to move up, continuing a trend which began in the fourth quarter of 1993. The cyclical peak in long-term interest rates was reached on November 7 and 14, 1994 when 30-year Treasury bonds attained an 8.16% yield. Thereafter, long-term Treasury bond yields generally declined.

Beginning in mid-February 1996, long-term interest rates moved upward from their previous lows. After initially reaching a level of 6.75% on March 15, 1996, long-term interest rates continued to climb and reached a peak of 7.19% on July 5 and 8, 1996. For the period leading up to the 1996 Presidential election, long-term Treasury bonds generally traded within this range. After the election, interest rates moderated, returning to a level somewhat below the previous trading range. Thereafter, in December 1996, interest rates returned to a range of 6.5% to 7.0% which existed for much of 1996.

On March 25, 1997, the FOMC decided to tighten monetary conditions through a one-quarter percentage point increase in the Fed Funds rate. This tightening increased the Fed Funds rate to 5.5%. In making this move, the FOMC stated that it was concerned by persistent strength of demand in the economy, which it feared would increase the risk of inflationary imbalances that could eventually interfere with the long economic expansion.

In the fourth quarter of 1997, the yields on Treasury bonds began to decline rapidly in response to an increase in demand for Treasury securities caused by a flight to safety triggered by the currency and stock market crisis in Asia. Liquidity provided by the Treasury market

makes these bonds an attractive investment in times of crisis. This is because Treasury securities encompass a very large market which provides ease of trading and carry a premium for safety. During the fourth quarter of 1997, Treasury bond yields pierced the psychologically important 6% level for the first time since 1993.

Through the first half of 1998, the yields on long-term Treasury bonds fluctuated within a range of about 5.6% to 6.1% reflecting their attractiveness and safety. In the third quarter of 1998, there was further deterioration of investor confidence in global financial markets. This loss of confidence followed the moratorium (i.e., default) by Russia on its sovereign debt and fears associated with problems in Latin America. While not significant to the global economy in the aggregate, the August 17 default by Russia had a significant negative impact on investor confidence, following earlier discontent surrounding the crisis in Asia. These events subsequently led to a general pull back of risk-taking as displayed by banks growing reluctance to lend, worries of an expanding credit crunch, lower stock prices, and higher yields on bonds of riskier companies. These events contributed to the failure of the hedge fund, Long-Term Capital Management.

In response to these events, the FOMC cut the Fed Funds rate just prior to the mid-term Congressional elections. The FOMC's action was based upon concerns over how increasing weakness in foreign economies would affect the U.S. economy. As recently as July 1998, the FOMC had been more concerned about fighting inflation than the state of the economy. The initial rate cut was the first of three reductions by the FOMC. Thereafter, the yield on long-term Treasury bonds reached a 30-year low of 4.70% on October 5, 1998. Long-term Treasury yields below 5% had not been seen since 1967. Unlike the first rate cut that was widely anticipated, the

second rate reduction by the FOMC was a surprise to the markets. A third reduction in short-term interest rates occurred in November 1998 when the FOMC reduced the Fed Funds rate to 4.75%.

All of these events prompted an increase in the prices for Treasury bonds which lead to the low yields described above. Another factor that contributed to the decline in yields on long-term Treasury bonds was a reduction in the supply of new Treasury issues coming to market due to the Federal budget surplus -- the first in nearly 30 years. The dollar amount of Treasury bonds being issued declined by 30% in two years, thus resulting in higher prices and lower yields. In addition, rumors of some struggling hedge funds unwinding their positions further added to the gains in Treasury bond prices.

The financial crisis that spread from Asia to Russia and to Latin America pushed nervous investors from stocks into Treasury bonds, thus increasing demand for bonds, just when supply was shrinking. There was also a move from corporate bonds to Treasury bonds to take advantage of appreciation in the Treasury market. This resulted in a certain amount of exuberance for Treasury bond investments that formerly was reserved for the stock market. Moreover, yields in the fourth quarter of 1998 became extremely volatile as shown by Treasury yields that fell from 5.10% on September 29 to 4.70 percent on October 5, and thereafter returned to 5.10% on October 13. A decline and rebound of 40 basis points in Treasury yields in a two-week time frame is remarkable.

Beginning in mid-1999, the FOMC raised interest rates on six occasions reversing its actions in the fall of 1998. On June 30, 1999, August 24, 1999, November 16, 1999, February 2, 2000, March 21, 2000, and May 16, 2000, the FOMC raised the Fed Funds rate to 6.50%. This

brought the Fed Funds rate to its highest level since 1991, and was 175 basis points higher than the level that occurred at the height of the Asian currency and stock market crisis. At the time, these actions were taken in response to more normally functioning financial markets, tight labor markets, and a reversal of the monetary ease that was required earlier in response to the global financial market turmoil.

As the year 2000 drew to a close, economic activity slowed and consumer confidence began to weaken. In two steps at the beginning and at the end of January 2001, the FOMC reduced the Fed Funds rate by one percentage point. These actions brought the Fed Funds rate to 5.50%. The FOMC described its actions as "a rapid and forceful response of monetary policy" to eroding consumer and business confidence exemplified by weaker retail sales and business spending on capital equipment and cut backs in manufacturing production. Subsequently, on March 20, 2001, April 18, 2001, May 15, 2001, June 27, 2001, and August 21, 2001, the FOMC lowered the Fed Funds in steps consisting of three 50 basis points decrements followed by two 25 basis points decrements. These actions took the Fed Funds rate to 3.50%. The FOMC observed on August 21, 2001:

> "Household demand has been sustained, but business profits and capital spending continue to weaken and growth abroad is slowing, weighing on the U.S. economy. The associated easing of pressures on labor and product markets is expected to keep inflation contained.
>
> Although long-term prospects for productivity growth and the economy remain favorable, the Committee continues to believe that against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the risks are weighted mainly toward conditions that may generate economic weakness in the foreseeable future."

After the terrorist attack on September 11, 2001, the FOMC made two additional 50 basis points reductions in the Fed Funds rate. The first reduction occurred on September 17, 2001 and followed the four-day closure of the financial markets following the terrorist attacks. The second reduction occurred at the October 2 meeting of the FOMC where it observed:

> "The terrorist attacks have significantly heightened uncertainty in an economy that was already weak. Business and household spending as a consequence are being further damped. Nonetheless, the long-term prospects for productivity growth and the economy remain favorable and should become evident once the unusual forces restraining demand abate."

Afterward, the FOMC reduced the Fed Funds rate by 50 basis points on November 6, 2001 and by 25 basis points on December 11, 2001. In total, short-term interest rates were reduced by the FOMC eleven (11) times during the year 2001. These actions cut the Fed Funds rate by 4.75% and resulted in 1.75% for the Fed Funds rate.

In an attempt to deal with weakening fundamentals in the economy recovering from the recession that began in March 2001, the FOMC provided a psychologically important one-half percentage point reduction in the federal funds rate. The rate cut was twice as large as the market expected, and brought the fed funds rate to 1.25% on November 6, 2002. The FOMC stated that:

> "The Committee continues to believe that an accommodative stance of monetary policy, coupled with still-robust underlying growth in productivity, is providing important ongoing support to economic activity. However, incoming economic data have tended to confirm that greater uncertainty, in part attributable to heightened geopolitical risks, is currently inhibiting spending, production, and employment. Inflation and inflation expectations remain well contained.
>
> In these circumstances, the Committee believes that today's

> additional monetary easing should prove helpful as the economy works its way through this current soft spot. With this action, the Committee believes that, against the background of its long-run goals of price stability and sustainable economic growth and of the information currently available, the risks are balanced with respect to the prospects for both goals in the foreseeable future."

As 2003 unfolded, there was a continuing expectation of lower yields on Treasury securities. In fact, the yield on ten-year Treasury notes reached a 45-year low near the end of the second quarter of 2003. For long-term Treasury bonds, those yields culminated with a 4.24% yield on June 13, 2003. Soon thereafter, the FOMC reduced the Fed Funds rate by 25 basis points on June 25, 2003. In announcing its action, the FOMC stated:

> "The Committee continues to believe that an accommodative stance of monetary policy, coupled with still robust underlying growth in productivity, is providing important ongoing support to economic activity. Recent signs point to a firming in spending, markedly improved financial conditions, and labor and product markets that are stabilizing. The economy, nonetheless, has yet to exhibit sustainable growth. With inflationary expectations subdued, the Committee judged that a slightly more expansive monetary policy would add further support for an economy which it expects to improve over time."

Thereafter, intermediate and long-term Treasury yields moved marketedly higher. Higher yields on long-term Treasury bonds, which exceeded 5.00% can be traced to: (i) the market's disappointment that the Fed Funds rate was not reduced below 1.00%, (ii) an indication that the Fed will not use unconventional methods for implementing monetary policy, (iii) growing confidence in a strengthening economy, and (iv) a Federal budget deficit that is projected to be $455 billion in 2003 (however, as subsequently reported, the actual deficit was $374 billion) and $475 billion in 2004 (revised subsequently, the estimated deficit was $500 billion in 2004). All

these factors significantly changed the seniment in the bond market.

For the remainder of 2003, the FOMC continued with its balanced monetary policy, thereby retaining the 1% Fed Funds rate. However, in 2004, the FOMC initiated a policy of moving toward a more neutral Fed Funds rate (i.e., removing the bias of abnormal low rates). On June 30, 2004, August 10, 2004, September 21, 2004, November 10, 2004, December 14, 2004, February 2, 2005, March 22, 2005, May 3, 2005, June 30, 2005, August 9, 2005, September 20, 2005, November 1, 2005, December 13, 2005, January 31, 2006, March 28, 2006, May 10, 2006, and June 29, 2006, the FOMC increased the Fed Funds rate in seventeen 25 basis point increments. These policy actions are widely interpreted as part of the process of moving toward a more neutral range for the Fed Funds rate.

Just after the FOMC meeting on August 7, 2007, where the FOMC decided to retain a 5.25% Fed Funds rate, turmoil in the credit markets prompted central banks throughout the world to inject over $325 billion of reserves into the banking system over a three-day period in reaction to a credit crunch. Problems had been developing earlier in 2007, beginning in the market for asset-backed securities linked to subprime mortgages. Valuation uncertainties for these securities caused liquidity concerns for hedge funds, investment banks, and financial institutions. The market for commercial paper, the most liquid part of the credit markets for non-Treasury securities, was also affected. In response to the market turmoil, the FOMC issued the following statement, the first of its type since after the September 11, 2001 terrorists' attack.

> "The Federal Reserve is providing liquidity to facilitate the orderly functioning of financial markets.
>
> The Federal Reserve will provide reserves as necessary through open market operations to promote trading in the federal funds

> market at rates close to the Federal Open Market Committee's target rate of 5-1/4 percent. In current circumstances, depository institutions may experience unusual funding needs because of dislocations in money and credit markets. As always, the discount window is available as a source of funding."

Then, one week after its initial announcement, the FOMC made a surprise reduction of 50 basis points in the discount rate to narrow the spread between this rate and the target Fed Funds rate. At the same time, the FOMC made the following statement:

> "Financial market conditions have deteriorated, and tighter credit conditions and increased uncertainty have the potential to restrain economic growth going forward. In these circumstances, although recent data suggest that the economy has continued to expand at a moderate pace, the Federal Open Market Committee judges that the downside risks to growth have increased appreciably. The Committee is monitoring the situation and is prepared to act as needed to mitigate the adverse effects on the economy arising from the disruptions in financial markets."

Thereafter, at its regularly scheduled meeting on September 18, 2007, the FOMC reduced the target Fed Funds rate to 4.75% and the discount rate was reduced to 5.25% in an effort to forestall the adverse effects of the financial market turmoil on the economy generally. Further reductions of 25 basis points occurred at the next two FOMC meetings on October 31, 2007 and on December 11, 2007. The December 11, 2007 FOMC statement indicated that:

> Incoming information suggests that economic growth is slowing, reflecting the intensification of the housing correction and some softening in business and consumer spending. Moreover, strains in financial markets have increased in recent weeks. Today's action, combined with the policy actions taken earlier, should help promote moderate growth over time.
>
> Readings on core inflation have improved modestly this year, but elevated energy and commodity prices, among other factors, may put upward pressure on inflation. In this context, the Committee judges that some inflation risks remain, and it will continue to monitor inflation developments carefully.

> Recent developments, including the deterioration in financial market conditions, have increased the uncertainty surrounding the outlook for economic growth and inflation. The Committee will continue to assess the effects of financial and other developments on economic prospects and will act as needed to foster price stability and sustainable economic growth.

With these actions, the Fed Funds rate and the discount rate closed the calendar year 2008 at 4.25% and 4.75%, respectively.

Public Utility Bond Yields

The Risk Premium analysis of the cost of equity is represented by the combination of a firm's borrowing rate for long-term debt capital plus a premium that is required to reflect the additional risk associated with the equity of a firm as explained in Attachment NG-PRM-8. Due to the senior nature of the long-term debt of a firm, its cost is lower than the cost of equity due to the prior claim which lenders have on the earnings and assets of a corporation.

As a generalization, all interest rates track to varying degrees of the benchmark yields established by the market for Treasury securities. Public utility bond yields usually reflect the underlying Treasury yield associated with a given maturity plus a spread to reflect the specific credit quality of the issuing public utility. Market sentiment can also have an influence on the spreads as described below. The spread in the yields on public utility bonds and Treasury bonds varies with market conditions, as does the relative level of interest rates at varying maturities shown by the yield curve.

Pages 1 and 2 of Attachment NG-PRM-19 provide the recent history of long-term public utility bond yields for the rating categories of Aa, A and Baa (no yields are shown for Aaa rated

public utility bonds because this index has been discontinued). The top four rating categories of Aaa, Aa, A, and Baa are known as "investment grades" and are generally regarded as eligible for bank investments under commercial banking regulations. These investment grades are distinguished from "junk" bonds which have ratings of Ba and below.

A relatively long history of the spread between the yields on long-term A-rated public utility bonds and 20-year Treasury bonds is shown on page 3 of Attachment NG-PRM-19. There, it is shown that those spreads were about one percentage point during for the years 1994 through 1997. With the aversion to risk and flight to quality described earlier, a significant widening of the spread in the yields between corporate (e.g., public utility) and Treasury bonds developed in 1998, after an initial widening of the spread that began in the fourth quarter of 1997. The significant widening of spreads in 1998 was unexpected by some technically savvy investors, as shown by the debacle at the Long-Term Capital Management hedge fund. When Russia defaulted its debt on August 17, some investors had to cover short positions when Treasury prices spiked upward. Short covering by investors that guessed wrong on the relationship between corporate and Treasury bonds also contributed to the run-up in Treasury bond prices by increasing the demand for them. This helped to contribute to a widening of the spreads between corporate and Treasury bonds.

As shown on page 3 of Attachment NG-PRM-19, the spread in yields between A-rated public utility bonds and 20-year Treasury bonds were about one percentage point prior to 1998, 1.32% in 1998, 1.42% in 1999, 2.01% in 2000, 2.13% in 2001, 1.94% in 2002, 1.62% in 2003, 1.12% in 2004, 1.01% in 2005, and 1.08% in 2006. As shown by the monthly data presented on pages 4 and 5 of Attachment NG-PRM-19, the interest rate spread between the yields on 20-

year Treasury bonds and A-rated public utility bonds was 1.09 percentage points for the twelve-months ended October 2007. For the six- and three-month periods ending October 2007, the yield spread was 1.16% and 1.29%, respectively. Spreads widened with the development of the credit crunch in the third quarter of 2007.

Risk-Free Rate of Return in the CAPM

Regarding the risk-free rate of return (see Attachment NG-PRM-9), pages 2 and 3 of Attachment NG-PRM-21 provide the yields on the broad spectrum of Treasury Notes and Bonds. Some practitioners of the CAPM would advocate the use of short-term treasury yields (and some would argue for the yields on 91-day Treasury Bills). Other advocates of the CAPM would advocate the use of longer-term treasury yields as the best measure of a risk-free rate of return. As Ibbotson has indicated:

> The Cost of Capital in a Regulatory Environment. When discounting cash flows projected over a long period, it is necessary to discount them by a long-term cost of capital. Additionally, regulatory processes for setting rates often specify or suggest that the desired rate of return for a regulated firm is that which would allow the firm to attract and retain debt and equity capital over the long term. Thus, the long-term cost of capital is typically the appropriate cost of capital to use in regulated ratesetting. (Stocks, Bonds, Bills and Inflation - 1992 Yearbook, pages 118-119)

As indicated above, long-term Treasury bond yields represent the correct measure of the risk-free rate of return in the traditional CAPM. Very short term yields on Treasury bills should be avoided for several reasons. First, rates should be set on the basis of financial conditions that will exist during the effective period of the proposed rates. Second, 91-day Treasury bill yields are more volatile than longer-term yields and are greatly influenced by FOMC monetary policy, political, and economic situations. Moreover, Treasury bill yields have been shown to be

empirically inadequate for the CAPM. Some advocates of the theory would argue that the risk-free rate of return in the CAPM should be derived from quality long-term corporate bonds.

RISK PREMIUM ANALYSIS

The cost of equity requires recognition of the risk premium required by common equities over long-term corporate bond yields. In the case of senior capital, a company contracts for the use of long-term debt capital at a stated coupon rate for a specific period of time and in the case of preferred stock capital at a stated dividend rate, usually with provision for redemption through sinking fund requirements. In the case of senior capital, the cost rate is known with a high degree of certainty because the payment for use of this capital is a contractual obligation, and the future schedule of payments is known. In essence, the investor-expected cost of senior capital is equal to the realized return over the entire term of the issue, absent default.

The cost of equity, on the other hand, is not fixed, but rather varies with investor perception of the risk associated with the common stock. Because no precise measurement exists as to the cost of equity, informed judgment must be exercised through a study of various market factors which motivate investors to purchase common stock. In the case of common equity, the realized return rate may vary significantly from the expected cost rate due to the uncertainty associated with earnings on common equity. This uncertainty highlights the added risk of a common equity investment.

As one would expect from traditional risk and return relationships, the cost of equity is affected by expected interest rates. As noted in Attachment NG-PRM-7, yields on long-term corporate bonds traditionally consist of a real rate of return without regard to inflation, an increment to reflect investor perception of expected future inflation, the investment horizon

shown by the term of the issue until maturity, and the credit risk associated with each rating category.

The Risk Premium approach recognizes the required compensation for the more risky common equity over the less risky secured debt position of a lender. The cost of equity stated in terms of the familiar risk premium approach is:

$$k=i+RP$$

where, the cost of equity *("k")* is equal to the interest rate on long-term corporate debt *("i")*, plus an equity risk premium *("RP")* which represents the additional compensation for the riskier common equity.

Equity Risk Premium

The equity risk premium is determined as the difference in the rate of return on debt capital and the rate of return on common equity. Because the common equity holder has only a residual claim on earnings and assets, there is no assurance that achieved returns on common equities will equal expected returns. This is quite different from returns on bonds, where the investor realizes the expected return during the entire holding period, absent default. It is for this reason that common equities are always more risky than senior debt securities. There are investment strategies available to bond portfolio managers that immunize bond returns against fluctuations in interest rates because bonds are redeemed through sinking funds or at maturity, whereas no such redemption is mandated for public utility common equities.

It is well recognized that the expected return on more risky investments will exceed the required yield on less risky investments. Neither the possibility of default on a bond nor the

maturity risk detracts from the risk analysis, because the common equity risk rate differential (i.e., the investor-required risk premium) is always greater than the return components on a bond. It should also be noted that the investment horizon is typically long-run for both corporate debt and equity, and that the risk of default (i.e., corporate bankruptcy) is a concern to both debt and equity investors. Thus, the required yield on a bond provides a benchmark or starting point with which to track and measure the cost rate of common equity capital. There is no need to segment the bond yield according to its components, because it is the total return demanded by investors that is important for determining the risk rate differential for common equity. This is because the complete bond yield provides the basis to determine the differential, and as such, consistency requires that the computed differential must be applied to the complete bond yield when applying the risk premium approach. To apply the risk rate differential to a partial bond yield would result in a misspecification of the cost of equity because the computed differential was initially determined by reference to the entire bond return.

The risk rate differential between the cost of equity and the yield on long-term corporate bonds can be determined by reference to a comparison of holding period returns (here defined as one year) computed over long time spans. This analysis assumes that over long periods of time investors' expectations are on average consistent with rates of return actually achieved. Accordingly, historical holding period returns must not be analyzed over an unduly short period because near-term realized results may not have fulfilled investors' expectations. Moreover, specific past period results may not be representative of investment fundamentals expected for the future. This is especially apparent when the holding period returns include negative returns

which are not representative of either investor requirements of the past or investor expectations for the future. The short-run phenomenon of unexpected returns (either positive or negative) demonstrates that an unduly short historical period would not adequately support a risk premium analysis. It is important to distinguish between investors' motivation to invest, which encompass positive return expectations, and the knowledge that losses can occur. No rational investor would forego payment for the use of capital, or expect loss of principal, as a basis for investing. Investors will hold cash rather than invest with the expectation of a loss.

Within these constraints, page 1 of Attachment NG-PRM-20 provides the historical holding period returns for the S&P Public Utility Index which has been independently computed and the historical holding period returns for the S&P Composite Index which have been reported in Stocks, Bonds, Bills and Inflation published by Ibbotson & Associates. The tabulation begins with 1928 because January 1928 is the earliest monthly dividend yield for the S&P Public Utility Index. I have considered all reliable data for this study to avoid the introduction of a particular bias to the results. The measurement of the common equity return rate differential is based upon actual capital market performance using realized results. As a consequence, the underlying data for this risk premium approach can be analyzed with a high degree of precision. Informed professional judgment is required only to interpret the results of this study, but not to quantify the component variables.

The risk rate differentials for all equities, as measured by the S&P Composite, are established by reference to long-term corporate bonds. For public utilities, the risk rate differentials are computed with the S&P Public Utilities as compared with public utility bonds.

The measurement procedure used to identify the risk rate differentials consisted of arithmetic means, geometric means, and medians for each series. Measures of the central tendency of the results from the historical periods provide the best indication of representative rates of return. In regulated ratesetting, the correct measure of the equity risk premium is the arithmetic mean because a utility must expect to earn its cost of capital in each year in order to provide investors with their long-term expectations. In other contexts, such as pension determinations, compound rates of return, as shown by the geometric means, may be appropriate. The median returns are also appropriate in ratesetting because they are a measure of the central tendency of a single period rate of return. Median values have also been considered in this analysis because they provide a return which divides the entire series of annual returns in half and are representative of a return that symbolizes, in a meaningful way, the central tendency of all annual returns contained within the analysis period. Medians are regularly included in many investor-influencing publications.

As previously noted, the arithmetic mean provides the appropriate point estimate of the risk premium. As further explained in Attachment NG-PRM-9, the long-term cost of capital in rate cases requires the use of the arithmetic means. To supplement my analysis, I have also used the rates of return taken from the geometric mean and median for each series to provide the bounds of the range to measure the risk rate differentials. This further analysis shows that when selecting the midpoint from a range established with the geometric means and medians, the arithmetic mean is indeed a reasonable measure for the long-term cost of capital. For the years 1928 through 2006, the risk premiums for each class of equity are:

	S&P Composite	S&P Public Utilities
Arithmetic Mean	5.86%	5.41%
Geometric Mean	4.25%	3.35%
Median	10.17%	7.29%
Midpoint of Range	7.21%	5.32%
Average	6.54%	5.37%

The empirical evidence suggests that the common equity risk premium is higher for the S&P Composite Index compared to the S&P Public Utilities.

If, however, specific historical periods were also analyzed in order to match more closely historical fundamentals with current expectations, the results provided on page 2 of Attachment NG-PRM-20 should also be considered. One of these sub-periods included the 54-year period, 1952-2006. These years follow the historic 1951 Treasury-Federal Reserve Accord which affected monetary policy and the market for government securities.

A further investigation was undertaken to determine whether realignment has taken place subsequent to the historic 1973 Arab Oil embargo and during the deregulation of the financial markets. In each case, the public utility risk premiums were computed by using the arithmetic mean, and the geometric means and medians to establish the range shown by those values. The time periods covering the more recent periods 1974 through 2006 and 1979 through 2006 contain events subsequent to the initial oil shock and the advent of monetarism as Fed policy, respectively. For the 55-year, 33-year and 28-year periods, the public utility risk

premiums were 6.40%, 5.61%, and 5.83% respectively, as shown by the average of the specific point-estimates and the midpoint of the ranges provided on page 2 of Attachment NG-PRM-20.

CAPITAL ASSET PRICING MODEL

Modern portfolio theory provides a theoretical explanation of expected returns on portfolios of securities. The Capital Asset Pricing Model ("CAPM") attempts to describe the way prices of individual securities are determined in efficient markets where information is freely available and is reflected instantaneously in security prices. The CAPM states that the expected rate of return on a security is determined by a risk-free rate of return plus a risk premium which is proportional to the non-diversifiable (or systematic) risk of a security.

The CAPM theory has several unique assumptions that are not common to most other methods used to measure the cost of equity. As with other market-based approaches, the CAPM is an expectational concept. There has been significant academic research conducted that found that the empirical market line, based upon historical data, has a less steep slope and higher intercept than the theoretical market line of the CAPM. For equities with a beta less than 1.0, such as utility common stocks, the CAPM theoretical market line will underestimate the realistic expectation of investors in comparison with the empirical market line which shows that the CAPM may potentially misspecify investors' required return.

The CAPM considers changing market fundamentals in a portfolio context. The balance of the investment risk, or that characterized as unsystematic, must be diversified. Some argue that diversifiable (unsystematic) risk is unimportant to investors. But this contention is not completely justified because the business and financial risk of an individual company, including regulatory risk, are widely discussed within the investment community and therefore influence investors in regulated firms. In addition, I note that the CAPM assumes that

through portfolio diversification, investors will minimize the effect of the unsystematic (diversifiable) component of investment risk. Because it is not known whether the average investor holds a well-diversified portfolio, the CAPM must also be used with other models of the cost of equity.

To apply the traditional CAPM theory, three inputs are required: the beta coefficient *("β")*, a risk-free rate of return *("Rf")*, and a market premium *("Rm - Rf")*. The cost of equity stated in terms of the CAPM is:

$$k = Rf + \beta (Rm - Rf)$$

As previously indicated, it is important to recognize that the academic research has shown that the security market line was flatter than that predicted by the CAPM theory and it had a higher intercept than the risk-free rate. These tests indicated that for portfolios with betas less than 1.0, the traditional CAPM would understate the return for such stocks. Likewise, for portfolios with betas above 1.0, these companies had lower returns than indicated by the traditional CAPM theory. Once again, CAPM assumes that through portfolio diversification investors will minimize the effect of the unsystematic (diversifiable) component of investment risk. Therefore, the CAPM must also be used with other models of the cost of equity, especially when it is not known whether the average public utility investor holds a well-diversified portfolio.

Beta

The beta coefficient is a statistical measure which attempts to identify the non-diversifiable (systematic) risk of an individual security and measures the sensitivity of rates of

return on a particular security with general market movements. Under the CAPM theory, a security that has a beta of 1.0 should theoretically provide a rate of return equal to the return rate provided by the market. When employing stock price changes in the derivation of beta, a stock with a beta of 1.0 should exhibit a movement in price which would track the movements in the overall market prices of stocks. Hence, if a particular investment has a beta of 1.0, a one percent increase in the return on the market will result, on average, in a one percent increase in the return on the particular investment. An investment which has a beta less than 1.0 is considered to be less risky than the market.

The beta coefficient *("β")*, the one input in the CAPM application which specifically applies to an individual firm, is derived from a statistical application which regresses the returns on an individual security (dependent variable) with the returns on the market as a whole (independent variable). The beta coefficients for utility companies typically describe a small proportion of the total investment risk because the coefficients of determination (R^2) are low.

Page 1 of Attachment NG-PRM-21 provides the betas published by Value Line. By way of explanation, the Value Line beta coefficient is derived from a "straight regression" based upon the percentage change in the weekly price of common stock and the percentage change weekly of the New York Stock Exchange Composite average using a five-year period. The raw historical beta is adjusted by Value Line for the measurement effect resulting in overestimates in high beta stocks and underestimates in low beta stocks. Value Line then rounds its betas to the nearest .05 increment. Value Line does not consider dividends in the computation of its betas.

Market Premium

The final element necessary to apply the CAPM is the market premium. The market premium by definition is the rate of return on the total market less the risk-free rate of return *("Rm - Rf")*. In this regard, the market premium in the CAPM has been calculated from the total return on the market of equities using forecast and historical data. The future market return is established with forecasts by Value Line using estimated dividend yields and capital appreciation potential.

With regard to the forecast data, I have relied upon the Value Line forecasts of capital appreciation and the dividend yield on the 1,700 stocks in the Value Line Survey. According to the January 4, 2008 edition of The Value Line Investment Survey Summary and Index, (see page 5 of Attachment NG-PRM-21) the total return on the universe of Value Line equities is:

	Dividend Yield	+	Median Appreciation Potential	=	Median Total Return
As of January 4, 2008	1.9%	+	10.67%[1]	=	12.57%

The tabulation shown above provides the dividend yield and capital gains yield of the companies followed by Value Line. Another measure of the total market return is provided by the DCF return on the S&P 500 Composite index. As shown below, that return is 13.49%.

1 The estimated median appreciation potential is forecast to be 50% for 3 to 5 years hence. The annual capital gains yield at the midpoint of the forecast period is 10.67% (i.e., $1.50^{.25}$ - 1).

DCF Result for the S&P 500 Composite

D/P	(	1+.5g	)	+	g	=	k
1.88%	(	1.05750	)	+	11.50%	=	13.49%

where:	Price (P)	at	31-Dec-2007	= 1468.36
	Dividend (D)	for	3rd Qtr. '07	= 6.90
	Dividend (D)		annualized	= 27.60
	Growth (g)		First Call EpS	= 11.50%

Using these indicators, the total market return is 13.03% (12.57% + 13.49% = 26.06% ÷ 2) using both the Value Line and S&P derived returns. With the 13.03% forecast market return and the 4.75% risk-free rate of return, a 8.28% (13.03% - 4.75%) market premium would be indicated using forecast market data.

With regard to the historical data, I provided the rates of return from long-term historical time periods that have been widely circulated among the investment and academic community over the past several years, as shown on page 6 of Attachment NG-PRM-21. These data are published by Ibbotson Associates in its Stocks, Bonds, Bills and Inflation ("SBBI"). From the data provided on page 6 of Attachment NG-PRM-21, I calculate a market premium using the common stock arithmetic mean returns of 12.3% less government bond arithmetic mean returns of 5.8%. For the period 1926-2006, the market premium was 6.5% (12.3% - 5.8%). I should note that the arithmetic mean must be used in the CAPM because it is a single period model. It is further confirmed by Ibbotson who has indicated:

> *Arithmetic Versus Geometric Differences*
> For use as the expected equity risk premium in the CAPM, the *arithmetic* or *simple difference* of the *arithmetic* means of stock market returns and riskless rates is the relevant number. This is because the CAPM is an additive model where the cost of capital is the sum of its parts. Therefore, the CAPM expected

> equity risk premium must be derived by arithmetic, *not geometric*, subtraction.
>
> *Arithmetic Versus Geometric Means*
> The expected equity risk premium should always be calculated using the arithmetic mean. The arithmetic mean is the rate of return which, when compounded over multiple periods, gives the mean of the probability distribution of ending wealth values. This makes the arithmetic mean return appropriate for computing the cost of capital. The discount rate that equates expected (mean) future values with the present value of an investment is that investment's cost of capital. The logic of using the discount rate as the cost of capital is reinforced by noting that investors will discount their (mean) ending wealth values from an investment back to the present using the arithmetic mean, for the reason given above. They will therefore require such an expected (mean) return prospectively (that is, in the present looking toward the future) to commit their capital to the investment. (Stocks, Bonds, Bills and Inflation - 1996 Yearbook, pages 153-154)

For the CAPM, a market premium of 7.39% (6.5% + 8.28% = 14.78% ÷ 2) would be reasonable which is the average of the 6.5% using historical data and a market premium of 8.28% using forecasts.

COMPARABLE EARNINGS APPROACH

Value Line's analysis of the companies that it follows includes a wide range of financial and market variables, including nine items that provide ratings for each company. From these nine items, one category has been removed dealing with industry performance because, under approach employed, the particular business type is not significant. In addition, two categories have been ignored that deal with estimates of current earnings and dividends because they are not useful for comparative purposes. The remaining six categories provide relevant measures to establish comparability. The definitions for each of the six criteria (from the Value Line Investment Survey - Subscriber Guide) follow:

Timeliness Rank

> The rank for a stock's probable relative market performance in the year ahead. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the year-ahead market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next 12 months. Stocks ranked 3 (Average) will probably advance or decline with the market in the year ahead. Investors should try to limit purchases to stocks ranked 1 (Highest) or 2 (Above Average) for Timeliness.

Safety Rank

> A measure of potential risk associated with individual common stocks rather than large diversified portfolios (for which Beta is good risk measure). Safety is based on the stability of price, which includes sensitivity to the market (see Beta) as well as the stock's inherent volatility, adjusted for trend and other factors including company size, the penetration of its markets, product market volatility, the degree of financial leverage, the earnings quality, and the overall condition of the balance sheet. Safety Ranks range from 1 (Highest) to 5 (Lowest). Conservative investors should try to limit purchases to equities

ranked 1 (Highest) or 2 (Above Average) for Safety.

Financial Strength

The financial strength of each of the more than 1,600 companies in the VS II data base is rated relative to all the others. The ratings range from A++ to C in nine steps. (For screening purposes, think of an A rating as "greater than" a B). Companies that have the best relative financial strength are given an A++ rating, indicating an ability to weather hard times better than the vast majority of other companies. Those who don't quite merit the top rating are given an A+ grade, and so on. A rating as low as C++ is considered satisfactory. A rating of C+ is well below average, and C is reserved for companies with very serious financial problems. The ratings are based upon a computer analysis of a number of key variables that determine (a) financial leverage, (b) business risk, and (c) company size, plus the judgment of Value Line's analysts and senior editors regarding factors that cannot be quantified across-the-board for companies. The primary variables that are indexed and studied include equity coverage of debt, equity coverage of intangibles, "quick ratio", accounting methods, variability of return, fixed charge coverage, stock price stability, and company size.

Price Stability Index

An index based upon a ranking of the weekly percent changes in the price of the stock over the last five years. The lower the standard deviation of the changes, the more stable the stock. Stocks ranking in the top 5% (lowest standard deviations) carry a Price Stability Index of 100; the next 5%, 95; and so on down to 5. One standard deviation is the range around the average weekly percent change in the price that encompasses about two thirds of all the weekly percent change figures over the last five years. When the range is wide, the standard deviation is high and the stock's Price Stability Index is low.

Beta

A measure of the sensitivity of the stock's price to overall fluctuations in the New York Stock Exchange Composite Average. A Beta of 1.50 indicates that a stock tends to rise (or

fall) 50% more than the New York Stock Exchange Composite Average. Use Beta to measure the stock market risk inherent in any diversified portfolio of, say, 15 or more companies. Otherwise, use the Safety Rank, which measures total risk inherent in an equity, including that portion attributable to market fluctuations. Beta is derived from a least squares regression analysis between weekly percent changes in the price of a stock and weekly percent changes in the NYSE Average over a period of five years. In the case of shorter price histories, a smaller time period is used, but two years is the minimum. The Betas are periodically adjusted for their long-term tendency to regress toward 1.00.

Technical Rank

A prediction of relative price movement, primarily over the next three to six months. It is a function of price action relative to all stocks followed by Value Line. Stocks ranked 1 (Highest) or 2 (Above Average) are likely to outpace the market. Those ranked 4 (Below Average) or 5 (Lowest) are not expected to outperform most stocks over the next six months. Stocks ranked 3 (Average) will probably advance or decline with the market. Investors should use the Technical and Timeliness Ranks as complements to one another.

National Grid - RI Gas

Summary Cost of Capital

Type of Capital	Ratios	Cost Rate	Weighted Cost Rate
Long-term Debt	40.63%	7.99%	3.25%
Short-term Debt	11.66%	4.59%	0.53%
Total Debt	52.29%		3.78%
Common Equity	47.71%	11.50%	5.49%
Total	100.00%		9.27%

Indicated levels of fixed charge coverage assuming that the Company could actually achieve its overall cost of capital:

Pre-tax coverage of interest expense based upon a 40.200% composite federal and state income tax rate (12.96% ÷ 3.78%)	3.43 x
Post-tax coverage of interest expense (9.27% ÷ 3.78%)	2.45 x

Development of Regulatory Capital Components:		($millions)
Average Rate Base (Including CWIP)		$ 252.9
Gas In Storage		30.2
Working Capital Associated With Gas Purchases		19.5
Hazardous Waste Reserve		2.6
Total		305.2
Short-Term Debt amount		35.6
Assets financed with Permanent Capital		$ 269.6
	Ratios	
Long-term debt amount	46%	$ 124.0
Common Equity amount	54%	145.6
Total		$ 269.6

National Grid - RI Gas
Capitalization and Financial Statistics
2002-2006, Inclusive

	2006	2005	2004	2003	2002	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 237.7	$ 291.0	$ 263.3	$ 228.6	$ 193.7	
Short-Term Debt	$ -	$ -	$ -	$ -	$ -	
Total Capital	$ 237.7	$ 291.0	$ 263.3	$ 228.6	$ 193.7	
Capital Structure Ratios						
Based on Permanent Captial:						Average
Common Equity [1]	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Common Equity [1]	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [1]	8.9%	10.0%	14.1%	16.5%	18.4%	13.6%
Operating Ratio [2]	94.5%	91.7%	91.5%	89.9%	89.5%	91.4%
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	0.2%	0.7%	0.7%	0.3%	0.7%	0.5%
Effective Income Tax Rate	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Internal Cash Generation/Construction [4]	116.2%	247.5%	359.1%	280.7%	294.3%	259.6%

See Page 2 for Notes.

National Grid – RI Gas
Capitalization and Financial Statistics
2002-2006, Inclusive

Notes:

(1) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account..

(2) Total operating expenses, maintenance, depreciation and taxes other than income as a percentage of operating revenues.

(3) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.

(4) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.

(5) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less AFUDC) as a percentage of average total debt.

(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.

(7) Common dividend coverage is the relationship of internally generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Audited Financial Statements by Deloitte Touche Tohmatsu

Gas Group
Capitalization and Financial Statistics [1]
2002-2006, Inclusive

	2006	2005	2004	2003	2002	Average
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 1,900.4	$ 1,823.5	$ 1,530.7	$ 1,233.7	$ 1,136.9	
Short-Term Debt	$ 263.5	$ 187.8	$ 141.9	$ 218.6	$ 138.3	
Total Capital	$ 2,163.9	$ 2,011.3	$ 1,672.6	$ 1,452.3	$ 1,275.2	
Market-Based Financial Ratios						
Price-Earnings Multiple	16 x	16 x	15 x	14 x	17 x	16 x
Market/Book Ratio	192.9%	198.4%	187.4%	180.9%	170.3%	186.0%
Dividend Yield	3.7%	3.7%	4.0%	4.5%	4.9%	4.2%
Dividend Payout Ratio	59.4%	59.6%	61.4%	61.5%	82.4%	64.9%
Capital Structure Ratios						
Based on Permanent Capital:						
Long-Term Debt	46.4%	46.1%	45.7%	46.7%	51.1%	47.2%
Preferred Stock	0.5%	0.4%	0.5%	0.3%	0.4%	0.4%
Common Equity [2]	53.2%	53.5%	53.8%	53.0%	48.5%	52.4%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	53.8%	51.9%	50.9%	55.2%	56.1%	53.6%
Preferred Stock	0.4%	0.4%	0.4%	0.3%	0.4%	0.4%
Common Equity [2]	45.8%	47.7%	48.7%	44.5%	43.4%	46.0%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	12.4%	12.2%	12.1%	13.0%	11.0%	12.1%
Operating Ratio [3]	89.1%	89.1%	88.1%	86.7%	84.9%	87.6%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	4.14 x	4.43 x	4.61 x	4.44 x	3.47 x	4.22 x
Post-tax: All Interest Charges	2.92 x	3.11 x	3.22 x	3.11 x	2.51 x	2.97 x
Overall Coverage: All Int. & Pfd. Div.	2.91 x	3.10 x	3.21 x	3.10 x	2.49 x	2.96 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	4.11 x	4.41 x	4.59 x	4.42 x	3.45 x	4.20 x
Post-tax: All Interest Charges	2.89 x	3.10 x	3.20 x	3.09 x	2.49 x	2.95 x
Overall Coverage: All Int. & Pfd. Div.	2.88 x	3.08 x	3.19 x	3.08 x	2.47 x	2.94 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	1.8%	0.9%	1.2%	1.2%	1.4%	1.3%
Effective Income Tax Rate	38.5%	38.1%	38.0%	38.1%	38.7%	38.3%
Internal Cash Generation/Construction [5]	78.0%	84.6%	94.4%	120.4%	82.9%	92.1%
Gross Cash Flow/ Avg. Total Debt [6]	18.9%	20.3%	22.0%	22.6%	18.2%	20.4%
Gross Cash Flow Interest Coverage [7]	4.15 x	4.53 x	5.28 x	5.32 x	4.08 x	4.67 x
Common Dividend Coverage [8]	3.10 x	3.06 x	3.50 x	3.71 x	3.16 x	3.31 x

See Page 2 for Notes.

Gas Group
Capitalization and Financial Statistics
2002-2006, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account.
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) as a percentage of average total debt.
(7) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Basis of Selection:
The Gas Group includes companies that (i) are engaged in the natural gas distribution business, (ii) have publicly-traded common stock, (iii) are contained in The Value Line Investment Survey, (iv) they have not recently cut or omitted their dividend, (v) they are not currently the target of a merger or acquisition, (vi) they operate with weather normalization and/or decoupling tariff features, and (vii) they have at least 60% of their assets subject to utility regulation.

		Corporate Credit Ratings		Stock	S&P Stock	Value Line
Ticker	Company	Moody's	S&P	Traded	Ranking	Beta
ATG	AGL Resources, Inc.	A3	A-	NYSE	A-	0.85
ATO	Atmos Energy Corp.	Baa3	BBB	NYSE	B+	0.85
NJR	New Jersey Resources Corp	Aa3	A+	NYSE	A	0.85
NWN	Northwest Natural Gas	A3	AA-	NYSE	B+	0.90
PNY	Piedmont Natural Gas Co.	A3	A	NYSE	A-	0.85
SJI	South Jersey Industries, Inc.	Baa2	BBB+	NYSE	B+	0.85
WGL	WGL Holdings, Inc.	A2	AA-	NYSE	B+	0.85
	Average	A3	A		B+	0.86

Note: Ratings are those of utility subsidiaries

Source of Information: Utility COMPUSTAT
Moody's Investors Service
Standard & Poor's Corporation
S&P Stock Guide

Standard & Poor's Public Utilities
Capitalization and Financial Statistics [1]
2002-2006, Inclusive

	2006	2005	2004	2003	2002	
			(Millions of Dollars)			
Amount of Capital Employed						
Permanent Capital	$ 15,146.0	$ 14,261.2	$14,164.3	$ 14,259.5	$13,850.0	
Short-Term Debt	$ 516.4	$ 480.8	$ 279.5	$ 266.9	$ 913.6	
Total Capital	$ 15,662.4	$ 14,742.0	$14,443.8	$ 14,526.4	$14,763.6	
Market-Based Financial Ratios						Average
Price-Earnings Multiple	16 x	16 x	15 x	13 x	14 x	15 x
Market/Book Ratio	206.6%	201.8%	182.4%	150.6%	152.2%	178.7%
Dividend Yield	3.5%	3.5%	3.8%	4.2%	5.0%	4.0%
Dividend Payout Ratio	56.3%	57.2%	70.3%	58.8%	72.8%	63.1%
Capital Structure Ratios						
Based on Permanent Captial:						
Long-Term Debt	54.1%	55.6%	57.4%	59.3%	60.4%	57.4%
Preferred Stock	1.1%	1.3%	1.5%	1.6%	1.8%	1.5%
Common Equity [2]	44.7%	43.2%	41.0%	39.1%	37.8%	41.2%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Based on Total Capital:						
Total Debt incl. Short Term	56.1%	57.7%	59.0%	60.7%	63.1%	59.3%
Preferred Stock	1.1%	1.2%	1.5%	1.6%	1.7%	1.4%
Common Equity [2]	42.8%	41.1%	39.5%	37.7%	35.2%	39.3%
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Rate of Return on Book Common Equity [2]	12.3%	11.4%	11.5%	10.0%	8.1%	10.7%
Operating Ratio [3]	81.2%	85.2%	84.4%	84.8%	84.5%	84.0%
Coverage incl. AFUDC [4]						
Pre-tax: All Interest Charges	3.42 x	3.20 x	3.02 x	2.57 x	2.41 x	2.92 x
Post-tax: All Interest Charges	2.64 x	2.54 x	2.42 x	2.12 x	1.99 x	2.34 x
Overall Coverage: All Int. & Pfd. Div.	2.61 x	2.50 x	2.38 x	2.07 x	1.95 x	2.30 x
Coverage excl. AFUDC [4]						
Pre-tax: All Interest Charges	3.38 x	3.17 x	2.99 x	2.53 x	2.37 x	2.89 x
Post-tax: All Interest Charges	2.60 x	2.51 x	2.39 x	2.08 x	1.95 x	2.31 x
Overall Coverage: All Int. & Pfd. Div.	2.56 x	2.47 x	2.35 x	2.03 x	1.90 x	2.26 x
Quality of Earnings & Cash Flow						
AFC/Income Avail. for Common Equity	2.4%	0.9%	3.0%	1.7%	2.6%	2.1%
Effective Income Tax Rate	32.4%	31.3%	26.2%	40.3%	29.0%	31.8%
Internal Cash Generation/Construction [5]	95.6%	108.3%	127.0%	127.8%	91.8%	110.1%
Gross Cash Flow/ Avg. Total Debt [6]	23.8%	21.3%	21.1%	20.8%	19.0%	21.2%
Gross Cash Flow Interest Coverage [7]	4.57 x	4.42 x	4.42 x	4.42 x	4.07 x	4.38 x
Common Dividend Coverage [8]	4.41 x	4.41 x	5.00 x	5.27 x	4.23 x	4.66 x

See Page 2 for Notes.

Standard & Poor's Public Utilities
Capitalization and Financial Statistics
2002-2006, Inclusive

Notes:

(1) All capitalization and financial statistics for the group are the arithmetic average of the achieved results for each individual company in the group.
(2) Excluding Accumulated Other Comprehensive Income ("OCI") from the equity account
(3) Total operating expenses, maintenance, depreciation and taxes other than income taxes as a percent of operating revenues.
(4) Coverage calculations represent the number of times available earnings, both including and excluding AFUDC (allowance for funds used during construction) as reported in its entirety, cover fixed charges.
(5) Internal cash generation/gross construction is the percentage of gross construction expenditures provided by internally-generated funds from operations after payment of all cash dividends divided by gross construction expenditures.
(6) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) as a percentage of average total debt.
(7) Gross Cash Flow (sum of net income, depreciation, amortization, net deferred income taxes and investment tax credits, less total AFUDC) plus interest charges, divided by interest charges.
(8) Common dividend coverage is the relationship of internally-generated funds from operations after payment of preferred stock dividends to common dividends paid.

Source of Information: Annual Reports to Shareholders
Utility COMPUSTAT

Standard & Poor's Public Utilities

Company Identities [1]

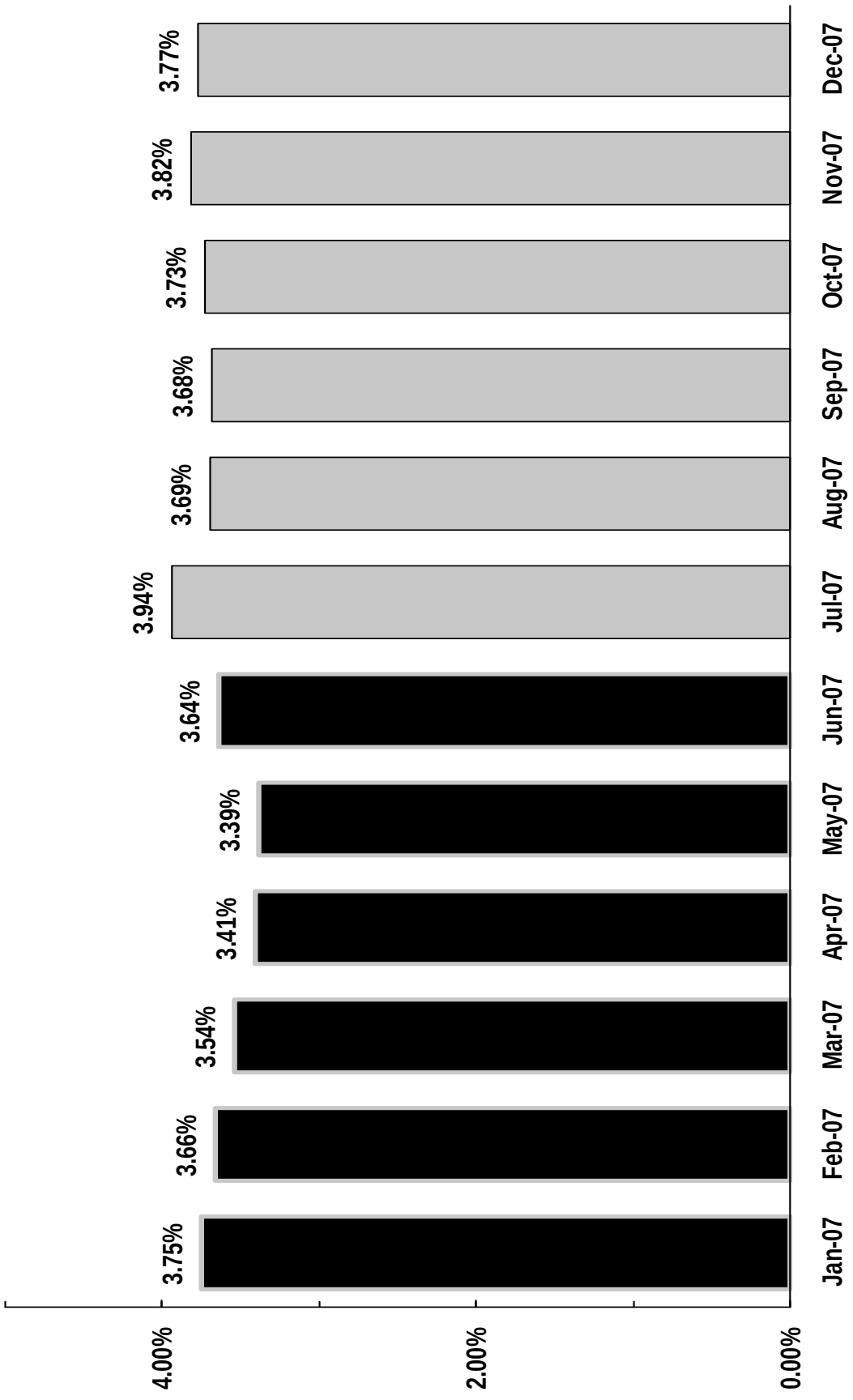
	Ticker	Credit Rating [2] Moody's	Credit Rating [2] S&P	Common Stock Traded	S&P Stock Ranking	Value Line Beta
Allegheny Energy	AYE	Baa3	BB+	NYSE	B-	1.85
Ameren Corporation	AEE	A2	BBB+	NYSE	A-	0.75
American Electric Power	AEP	Baa2	BBB	NYSE	B	1.20
CMS Energy	CMS	Ba1	BB	NYSE	C	1.45
CenterPoint Energy	CNP	Baa3	BBB	NYSE	B	0.65
Consolidated Edison	ED	A1	A	NYSE	B+	0.65
Constellation Energy Group	CEG	A3	BBB+	NYSE	B	0.95
DTE Energy Co.	DTE	Baa1	BBB	NYSE	B+	0.70
Dominion Resources	D	Baa1	BBB	NYSE	B+	0.95
Duke Energy	DUK	Baa2	BBB	NYSE	B+	1.20
Edison Int'l	EIX	Baa1	BBB+	NYSE	B	1.05
Entergy Corp.	ETR	Baa2	BBB	NYSE	B+	0.85
Exelon Corp.	EXC	A3	BBB+	NYSE	B+	0.80
FPL Group	FPL	A1	A	NYSE	A-	0.80
FirstEnergy Corp.	FE	Baa2	BBB	NYSE	B+	0.75
Integrys Energy Group	TEG	A1	A-	NYSE	B	0.85
Keyspan Energy	KSE	A3	A	NYSE	B	0.85
NICOR Inc.	GAS	A1	AA	NYSE	B	1.15
NiSource Inc.	NI	Baa2	BBB	NYSE	B	0.80
PG&E Corp.	PCG	Baa1	BBB	NYSE	B	1.10
PPL Corp.	PPL	Baa1	A-	NYSE	B	1.00
Pinnacle West Capital	PNW	Baa2	BBB-	NYSE	A-	0.90
Progress Energy, Inc.	PGN	Baa1	BBB	NYSE	B+	0.80
Public Serv. Enterprise Inc.	PEG	Baa1	BBB	NYSE	B+	0.90
Questar Corp.	STR	A2	A-	NYSE	A-	0.90
Sempra Energy	SRE	A2	A	NYSE	B	1.00
Southern Co.	SO	A2	A	NYSE	A-	0.65
TECO Energy	TE	Baa2	BBB-	NYSE	B-	1.00
TXU CORP	TXU	Baa3	BBB-	NYSE	B	1.05
Xcel Energy Inc	XEL	A3	BBB+	NYSE	B	0.80
Average for S&P Utilities		Baa1	BBB+		B	0.95

Note: [1] Includes companies contained in S&P Utility Compustat. AES Corp. and Dynegy, Inc. are not included.

[2] Ratings are those of utility subsidiaries

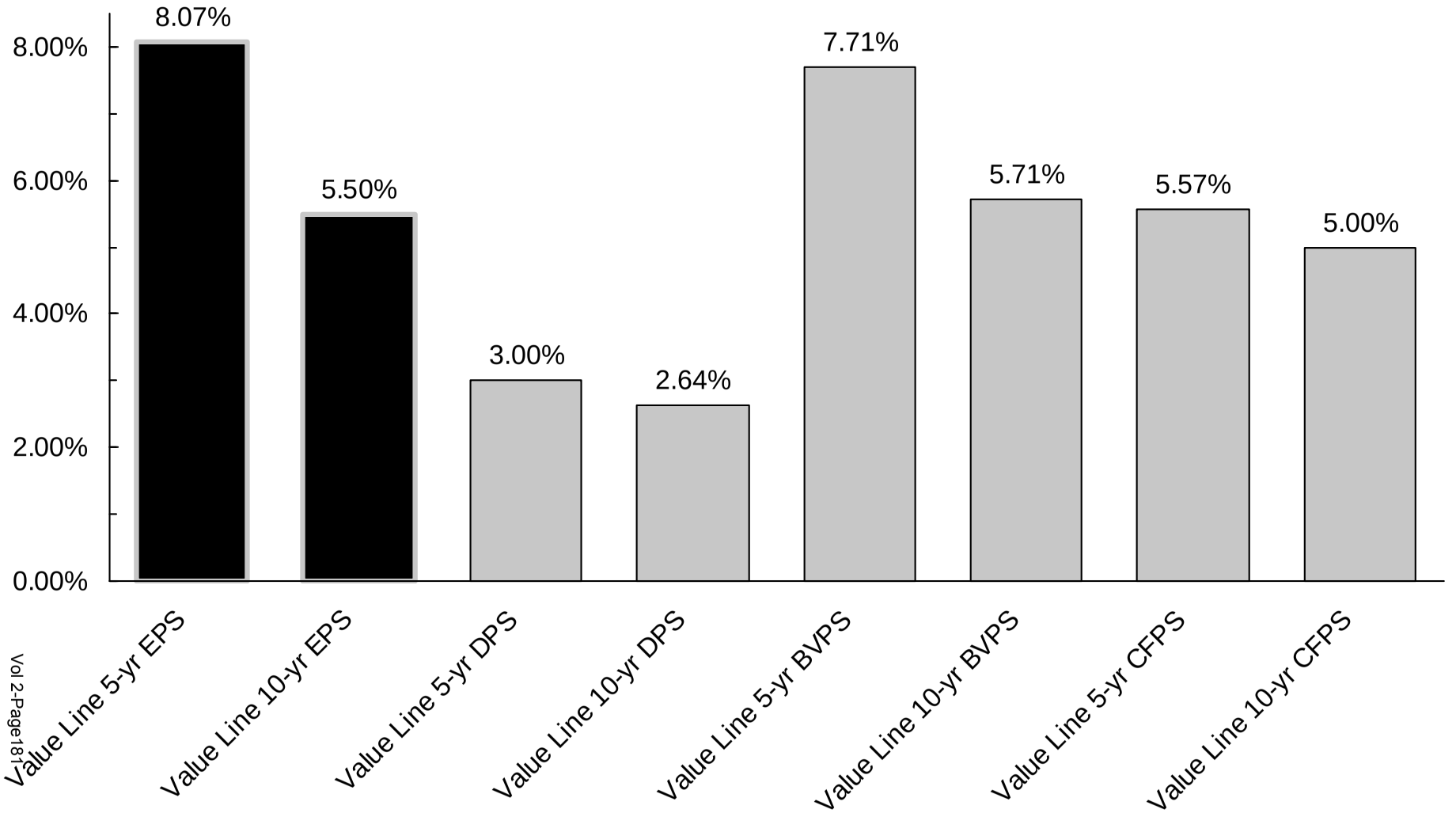
Source of Information:
Moody's Investors Service
Standard & Poor's Corporation
Standard & Poor's Stock Guide
Value Line Investment Survey for Windows

Gas Group
Monthly Dividend Yields



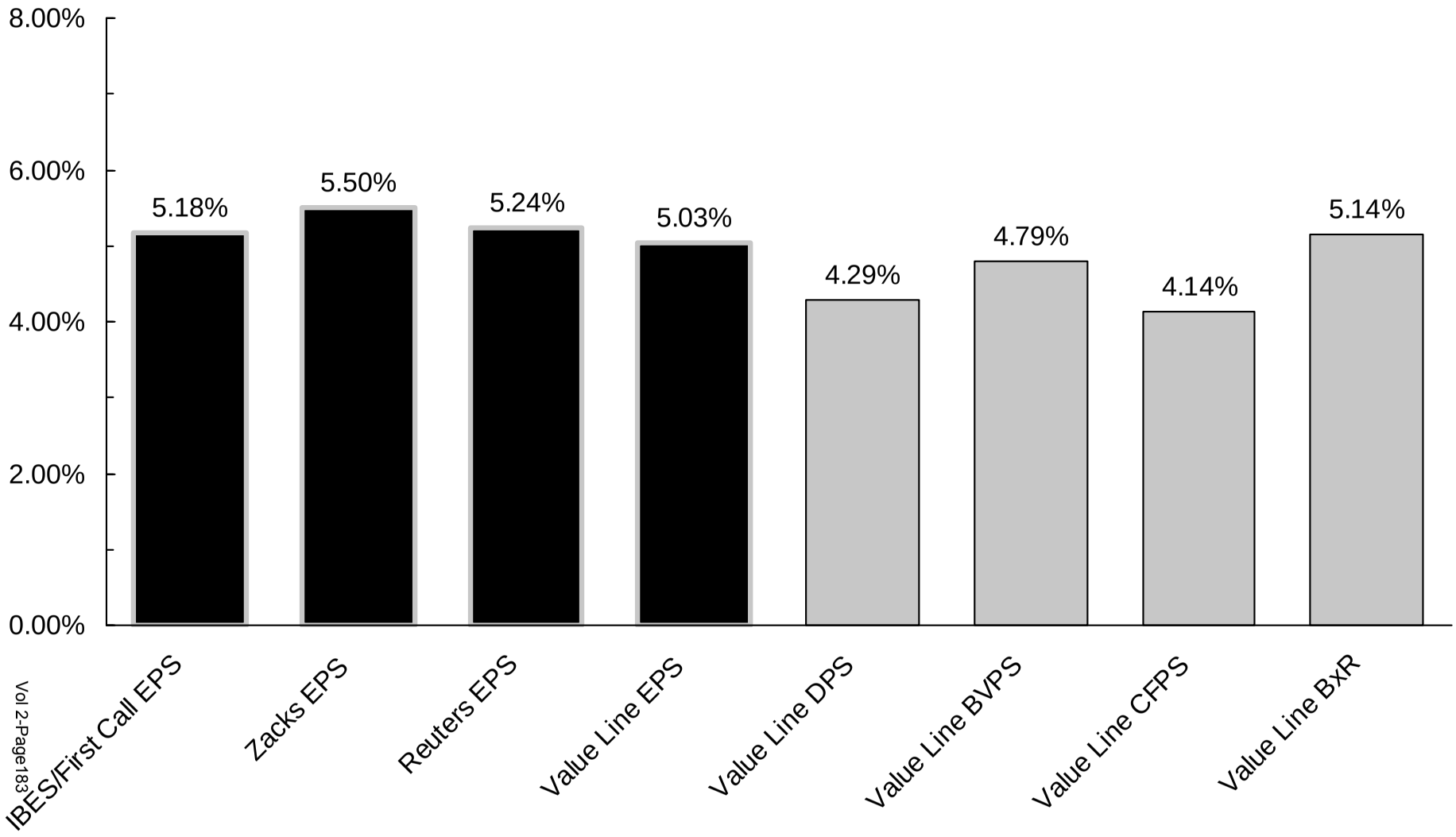
Gas Group

Historical Growth Rates



Earnings per Share=EPS Book Values per Share=BVPS
Dividends per Share=DPS Cash Flow per Share=CFPS
Percent Retained to Common Equity=BxR

Gas Group
Five-Year Projected Growth Rates



Earnings per Share=EPS Book Values per Share=BVPS
Dividends per Share=DPS Cash Flow per Share=CFPS
Percent Retained to Common Equity=BxR

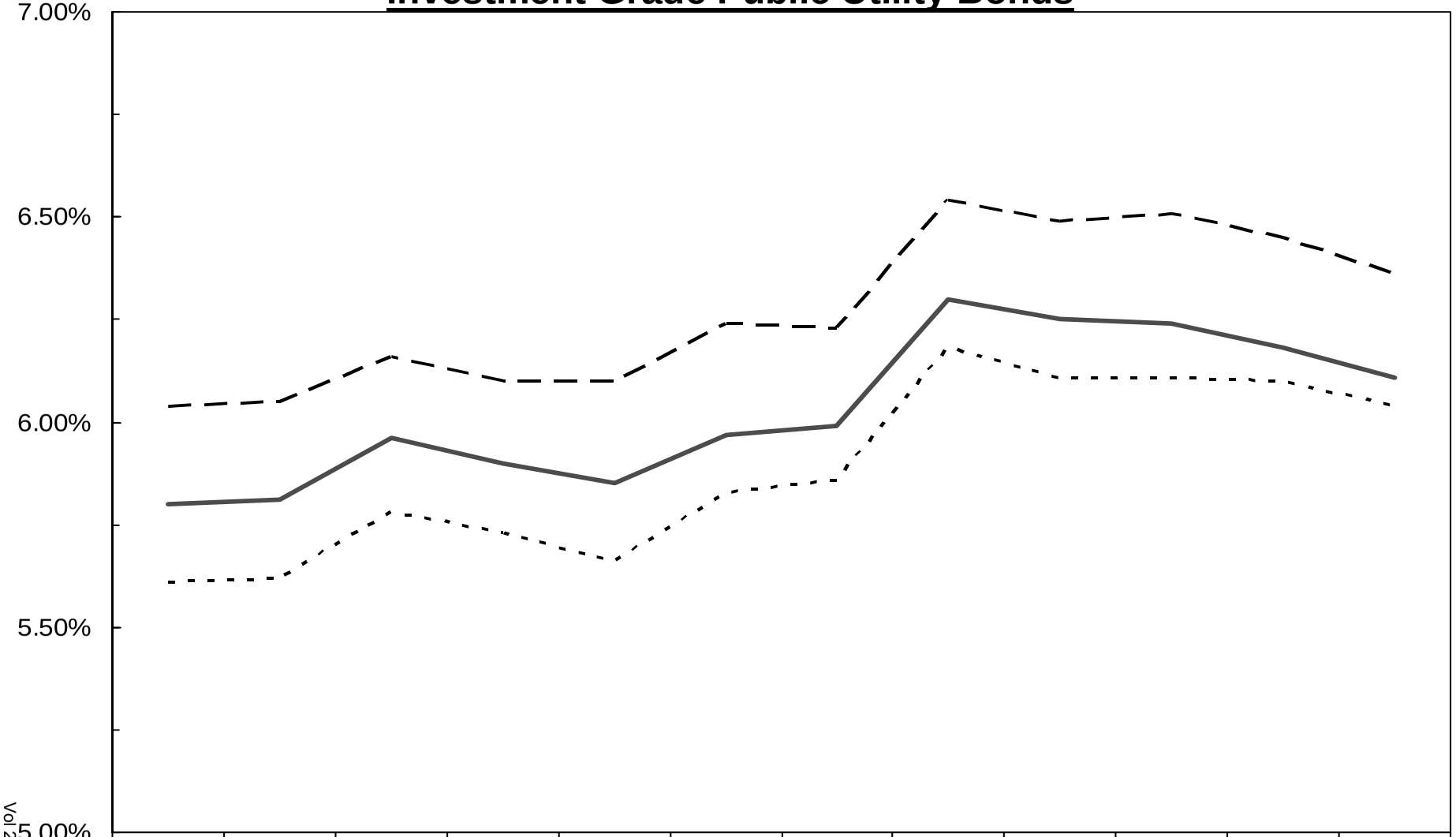
Natural Gas Industry
Analysis of Public Offerings of Common Stock
Years 2002-2006

	UTILICORP	MDU Resources	AGL RESOURCES	SOUTHERN UNION CO.	ATMOS ENERGY	VECTREN CORP.	SEMPRA ENERGY	PIEDMONT NATURAL	UGI CORP.
Date of Offering	01/25/2002	11/29/2002	02/11/2003	06/05/2003	06/18/2003	08/07/2003	10/08/2003	01/20/2004	03/18/2004
No. of shares offered (000)	11,000	2,100	5,600	9,500	4,000	6,500	15,000	4,250	7,500
Dollar amt. of offering ($000)	$ 253,000	$ 50,400	$ 123,200	$ 152,000	$ 101,240	$ 148,265	$ 420,000	$ 180,625	$ 240,750
Price to public	$ 23.000	$ 24.200	$ 22.000	$ 16.000	$ 25.310	$ 22.810	$ 28.000	$ 42.500	$ 32.100
Underwriter's discounts and commission	$ 0.748	$ 0.720	$ 0.770	$ 0.560	$ 1.013	$ 0.798	$ 0.840	$ 1.490	$ 1.404
Gross Proceeds	$ 22.252	$ 23.480	$ 21.230	$ 15.440	$ 24.297	$ 22.012	$ 27.160	$ 41.010	$ 30.696
Estimated company issuance expenses	NA	$ 0.092	$ 0.045	$ 0.089	$ 0.095	$ 0.046	$ 0.033	NA	$ 0.020
Net proceeds to company per share	$ 22.252	$ 23.388	$ 21.185	$ 15.351	$ 24.202	$ 21.966	$ 27.127	$ 41.010	$ 30.676
Underwriter's discount as a percent of offering price	3.3%	3.0%	3.5%	3.5%	4.0%	3.5%	3.0%	3.5%	4.4%
Issuance expense as a percent of offering price	NA	0.4%	0.2%	0.6%	0.4%	0.2%	0.1%	NA	0.1%
Total Issuance and selling expense as as a percent of offering price	3.3%	3.4%	3.7%	4.1%	4.4%	3.7%	3.1%	3.5%	4.5%

	NORTHWEST NATURAL	LACLEDE GROUP	SOUTHERN UNION CO.	AQUILA	ATMOS ENERGY	AGL RESOURCES	SOUTHERN UNION CO.	SEMCO Energy	Chesapeake Utilities	
Date of Offering	03/30/2004	05/06/2004	07/26/2004	08/18/2004	10/21/2004	11/19/2004	02/07/2005	08/09/2005	11/15/2006	
No. of shares offered (000)	1,200	1,500	11,000	40,000	14,000	9,600	14,913	4,300	600.3	
Dollar amt. of offering ($000)	$ 37,200	$ 40,200	$ 206,250	$ 102,000	$ 346,500	$ 297,696	$ 342,999	$ 27,176	$ 18,069	
Price to public	$ 31.000	$ 26.800	$ 18.750	$ 2.550	$ 24.750	$ 31.010	$ 23.000	$ 6.320	$ 30.100	
Underwriter's discounts and commission	$ 1.010	$ 0.871	$ 0.656	$ 0.099	$ 0.990	$ 0.930	$ 0.700	$ 0.253	$ 1.125	
Gross Proceeds	$ 29.990	$ 25.929	$ 18.094	$ 2.451	$ 23.760	$ 30.080	$ 22.300	$ 6.067	$ 28.975	
Estimated company issuance expenses	$ 0.146	$ 0.067	$ 0.091	NA	NA	$ 0.042	$ 0.067	$ 0.070	$ 0.375	
Net proceeds to company per share	$ 29.844	$ 25.862	$ 18.003	$ 2.451	$ 23.760	$ 30.038	$ 22.233	$ 5.997	$ 28.600	
										Average
Underwriter's discount as a percent of offering price	3.3%	3.3%	3.5%	3.9%	4.0%	3.0%	3.0%	4.0%	3.7%	3.5%
Issuance expense as a percent of offering price	0.5%	0.3%	0.5%	NA	NA	0.1%	0.3%	1.1%	1.2%	0.4%
Total Issuance and selling expense as as a percent of offering price	3.8%	3.6%	4.0%	3.9%	4.0%	3.1%	3.3%	5.1%	4.9%	3.9%

Source of Information: Public Utility Financial Tracker

Interest Rates for
Investment Grade Public Utility Bonds



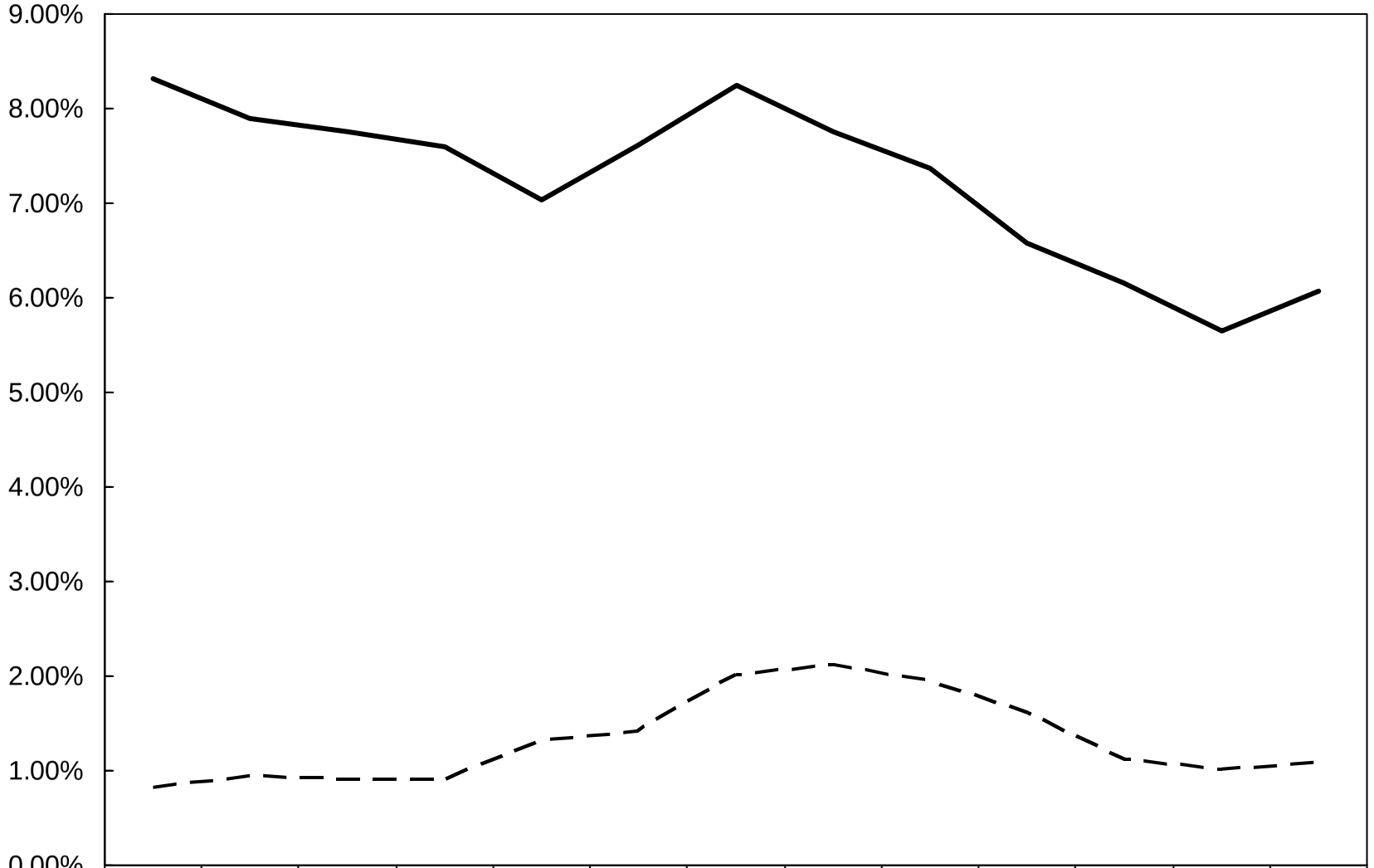
	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07
Aa	5.61%	5.62%	5.78%	5.73%	5.66%	5.83%	5.86%	6.18%	6.11%	6.11%	6.10%	6.04%
A	5.80%	5.81%	5.96%	5.90%	5.85%	5.97%	5.99%	6.30%	6.25%	6.24%	6.18%	6.11%
Baa	6.04%	6.05%	6.16%	6.10%	6.10%	6.24%	6.23%	6.54%	6.49%	6.51%	6.45%	6.36%

Interest Rates for Investment Grade Public Utility Bonds
Yearly for 2001-2006
and the Twelve Months Ended October 2007

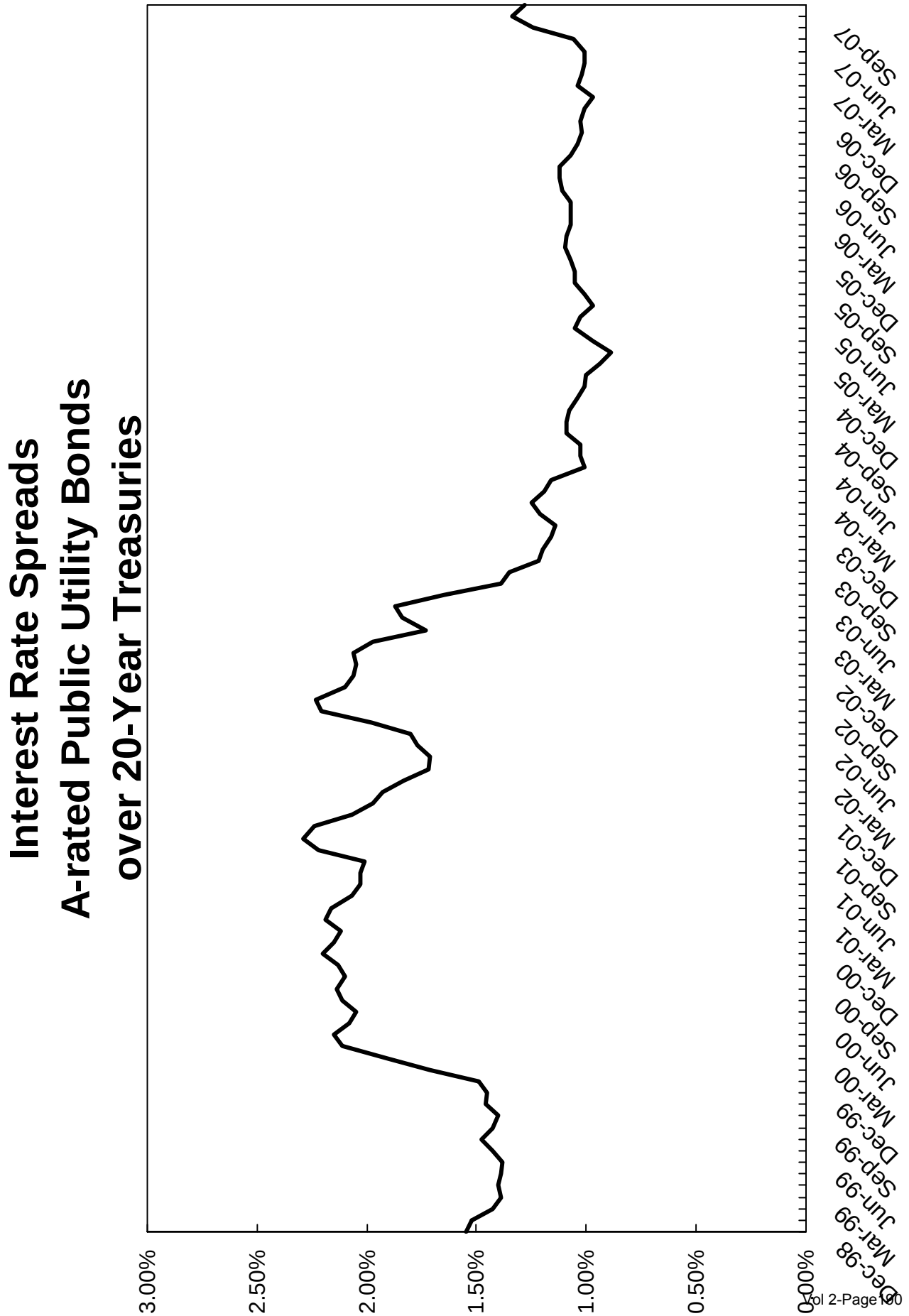
Years	Aa Rated	A Rated	Baa Rated	Average
2002	7.19%	7.37%	8.02%	7.53%
2003	6.40%	6.58%	6.84%	6.61%
2004	6.04%	6.16%	6.40%	6.20%
2005	5.44%	5.65%	5.93%	5.67%
2006	5.84%	6.07%	6.32%	6.08%
Five-Year Average	6.18%	6.37%	6.70%	6.42%
Months				
Nov-06	5.61%	5.80%	6.04%	5.82%
Dec-06	5.62%	5.81%	6.05%	5.83%
Jan-07	5.78%	5.96%	6.16%	5.96%
Feb-07	5.73%	5.90%	6.10%	5.91%
Mar-07	5.66%	5.85%	6.10%	5.87%
Apr-07	5.83%	5.97%	6.24%	6.01%
May-07	5.86%	5.99%	6.23%	6.03%
Jun-07	6.18%	6.30%	6.54%	6.34%
Jul-07	6.11%	6.25%	6.49%	6.28%
Aug-07	6.11%	6.24%	6.51%	6.28%
Sep-07	6.10%	6.18%	6.45%	6.24%
Oct-07	6.04%	6.11%	6.36%	6.17%
Twelve-Month Average	5.89%	6.03%	6.27%	6.06%
Six-Month Average	6.07%	6.18%	6.43%	6.22%
Three-Month Average	6.08%	6.18%	6.44%	6.23%

Source: Mergent Bond Record

Yields on
A-rated Public Utility Bonds and
Spreads over 20-Year Treasuries



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
A-rated Public Utility	8.31%	7.89%	7.75%	7.60%	7.04%	7.62%	8.24%	7.76%	7.37%	6.58%	6.16%	5.65%	6.07%
Spread vs. 20-year	0.82%	0.94%	0.92%	0.91%	1.32%	1.42%	2.01%	2.13%	1.94%	1.62%	1.12%	1.01%	1.08%


Interest Rate Spreads
A-rated Public Utility Bonds
over 20-Year Treasuries
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
Dec-98
Mar-99
Jun-99
Sep-99
Dec-99
Mar-00
Jun-00
Sep-00
Dec-00
Mar-01
Jun-01
Sep-01
Dec-01
Mar-02
Jun-02
Sep-02
Dec-02
Mar-03
Jun-03
Sep-03
Dec-03
Mar-04
Jun-04
Sep-04
Dec-04
Mar-05
Jun-05
Sep-05
Dec-05
Mar-06
Jun-06
Sep-06
Dec-06
Mar-07
Jun-07
Sep-07

A rated Public Utility Bonds
over 20-Year Treasuries

Year	A-rated Public Utility	20-Year Treasuries Yield	Spread
Dec-98	6.91%	5.36%	1.55%
Jan-99	6.97%	5.45%	1.52%
Feb-99	7.09%	5.66%	1.43%
Mar-99	7.26%	5.87%	1.39%
Apr-99	7.22%	5.82%	1.40%
May-99	7.47%	6.08%	1.39%
Jun-99	7.74%	6.36%	1.38%
Jul-99	7.71%	6.28%	1.43%
Aug-99	7.91%	6.43%	1.48%
Sep-99	7.93%	6.50%	1.43%
Oct-99	8.06%	6.66%	1.40%
Nov-99	7.94%	6.48%	1.46%
Dec-99	8.14%	6.69%	1.45%
Jan-00	8.35%	6.86%	1.49%
Feb-00	8.25%	6.54%	1.71%
Mar-00	8.28%	6.38%	1.90%
Apr-00	8.29%	6.18%	2.11%
May-00	8.70%	6.55%	2.15%
Jun-00	8.36%	6.28%	2.08%
Jul-00	8.25%	6.20%	2.05%
Aug-00	8.13%	6.02%	2.11%
Sep-00	8.23%	6.09%	2.14%
Oct-00	8.14%	6.04%	2.10%
Nov-00	8.11%	5.98%	2.13%
Dec-00	7.84%	5.64%	2.20%
Jan-01	7.80%	5.65%	2.15%
Feb-01	7.74%	5.62%	2.12%
Mar-01	7.68%	5.49%	2.19%
Apr-01	7.94%	5.78%	2.16%
May-01	7.99%	5.92%	2.07%
Jun-01	7.85%	5.82%	2.03%
Jul-01	7.78%	5.75%	2.03%
Aug-01	7.59%	5.58%	2.01%
Sep-01	7.75%	5.53%	2.22%
Oct-01	7.63%	5.34%	2.29%
Nov-01	7.57%	5.33%	2.24%
Dec-01	7.83%	5.76%	2.07%
Jan-02	7.66%	5.69%	1.97%
Feb-02	7.54%	5.61%	1.93%
Mar-02	7.76%	5.93%	1.83%
Apr-02	7.57%	5.85%	1.72%
May-02	7.52%	5.81%	1.71%
Jun-02	7.42%	5.65%	1.77%
Jul-02	7.31%	5.51%	1.80%
Aug-02	7.17%	5.19%	1.98%
Sep-02	7.08%	4.87%	2.21%
Oct-02	7.23%	5.00%	2.23%
Nov-02	7.14%	5.04%	2.10%
Dec-02	7.07%	5.01%	2.06%
Jan-03	7.07%	5.02%	2.05%
Feb-03	6.93%	4.87%	2.06%
Mar-03	6.79%	4.82%	1.97%
Apr-03	6.64%	4.91%	1.73%
May-03	6.36%	4.52%	1.84%
Jun-03	6.21%	4.34%	1.87%
Jul-03	6.57%	4.92%	1.65%
Aug-03	6.78%	5.39%	1.39%
Sep-03	6.56%	5.21%	1.35%
Oct-03	6.43%	5.21%	1.22%
Nov-03	6.37%	5.17%	1.20%
Dec-03	6.27%	5.11%	1.16%
Jan-04	6.15%	5.01%	1.14%
Feb-04	6.15%	4.94%	1.21%
Mar-04	5.97%	4.72%	1.25%
Apr-04	6.35%	5.16%	1.19%
May-04	6.62%	5.46%	1.16%
Jun-04	6.46%	5.45%	1.01%
Jul-04	6.27%	5.24%	1.03%
Aug-04	6.14%	5.07%	1.07%
Sep-04	5.98%	4.89%	1.09%
Oct-04	5.94%	4.85%	1.09%
Nov-04	5.97%	4.89%	1.08%
Dec-04	5.92%	4.88%	1.04%
Jan-05	5.78%	4.77%	1.01%
Feb-05	5.61%	4.61%	1.00%
Mar-05	5.83%	4.89%	0.94%
Apr-05	5.64%	4.75%	0.89%
May-05	5.53%	4.56%	0.97%
Jun-05	5.40%	4.35%	1.05%
Jul-05	5.51%	4.48%	1.03%
Aug-05	5.50%	4.53%	0.97%
Sep-05	5.52%	4.51%	1.01%
Oct-05	5.79%	4.74%	1.05%
Nov-05	5.88%	4.83%	1.05%
Dec-05	5.80%	4.73%	1.07%
Jan-06	5.75%	4.65%	1.10%
Feb-06	5.82%	4.73%	1.09%
Mar-06	5.98%	4.91%	1.07%
Apr-06	6.29%	5.22%	1.07%
May-06	6.42%	5.35%	1.07%
Jun-06	6.40%	5.29%	1.11%
Jul-06	6.37%	5.25%	1.12%
Aug-06	6.20%	5.08%	1.12%
Sep-06	6.00%	4.93%	1.07%
Oct-06	5.98%	4.94%	1.04%
Nov-06	5.80%	4.78%	1.02%
Dec-06	5.81%	4.78%	1.03%
Jan-07	5.96%	4.95%	1.01%
Feb-07	5.90%	4.93%	0.97%
Mar-07	5.85%	4.81%	1.04%
Apr-07	5.97%	4.95%	1.02%
May-07	5.99%	4.98%	1.01%
Jun-07	6.30%	5.29%	1.01%
Jul-07	6.25%	5.19%	1.06%
Aug-07	6.24%	5.00%	1.24%
Sep-07	6.18%	4.84%	1.34%
Oct-07	6.11%	4.83%	1.28%
Average:			
12-months			1.09%
6-months			1.16%
3-months			1.29%

S&P Composite Index and S&P Public Utility Index
Long-Term Corporate and Public Utility Bonds
Yearly Total Returns
1928-2006

Year	S & P Composite Index	S & P Public Utility Index	Long Term Corporate Bonds	Public Utility Bonds
1928	43.61%	57.47%	2.84%	3.08%
1929	-8.42%	11.02%	3.27%	2.34%
1930	-24.90%	-21.96%	7.98%	4.74%
1931	-43.34%	-35.90%	-1.85%	-11.11%
1932	-8.19%	-0.54%	10.82%	7.25%
1933	53.99%	-21.87%	10.38%	-3.82%
1934	-1.44%	-20.41%	13.84%	22.61%
1935	47.67%	76.63%	9.61%	16.03%
1936	33.92%	20.69%	6.74%	8.30%
1937	-35.03%	-37.04%	2.75%	-4.05%
1938	31.12%	22.45%	6.13%	8.11%
1939	-0.41%	11.26%	3.97%	6.76%
1940	-9.78%	-17.15%	3.39%	4.45%
1941	-11.59%	-31.57%	2.73%	2.15%
1942	20.34%	15.39%	2.60%	3.81%
1943	25.90%	46.07%	2.83%	7.04%
1944	19.75%	18.03%	4.73%	3.29%
1945	36.44%	53.33%	4.08%	5.92%
1946	-8.07%	1.26%	1.72%	2.98%
1947	5.71%	-13.16%	-2.34%	-2.19%
1948	5.50%	4.01%	4.14%	2.65%
1949	18.79%	31.39%	3.31%	7.16%
1950	31.71%	3.25%	2.12%	2.01%
1951	24.02%	18.63%	-2.69%	-2.77%
1952	18.37%	19.25%	3.52%	2.99%
1953	-0.99%	7.85%	3.41%	2.08%
1954	52.62%	24.72%	5.39%	7.57%
1955	31.56%	11.26%	0.48%	0.12%
1956	6.56%	5.06%	-6.81%	-6.25%
1957	-10.78%	6.36%	8.71%	3.58%
1958	43.36%	40.70%	-2.22%	0.18%
1959	11.96%	7.49%	-0.97%	-2.29%
1960	0.47%	20.26%	9.07%	9.01%
1961	26.89%	29.33%	4.82%	4.65%
1962	-8.73%	-2.44%	7.95%	6.55%
1963	22.80%	12.36%	2.19%	3.44%
1964	16.48%	15.91%	4.77%	4.94%
1965	12.45%	4.67%	-0.46%	0.50%
1966	-10.06%	-4.48%	0.20%	-3.45%
1967	23.98%	-0.63%	-4.95%	-3.63%
1968	11.06%	10.32%	2.57%	1.87%
1969	-8.50%	-15.42%	-8.09%	-6.66%
1970	4.01%	16.56%	18.37%	15.90%
1971	14.31%	2.41%	11.01%	11.59%
1972	18.98%	8.15%	7.26%	7.19%
1973	-14.66%	-18.07%	1.14%	2.42%
1974	-26.47%	-21.55%	-3.06%	-5.28%
1975	37.20%	44.49%	14.64%	15.50%
1976	23.84%	31.81%	18.65%	19.04%
1977	-7.18%	8.64%	1.71%	5.22%
1978	6.56%	-3.71%	-0.07%	-0.98%
1979	18.44%	13.58%	-4.18%	-2.75%
1980	32.42%	15.08%	-2.76%	-0.23%
1981	-4.91%	11.74%	-1.24%	4.27%
1982	21.41%	26.52%	42.56%	33.52%
1983	22.51%	20.01%	6.26%	10.33%
1984	6.27%	26.04%	16.86%	14.82%
1985	32.16%	33.05%	30.09%	26.48%
1986	18.47%	28.53%	19.85%	18.16%
1987	5.23%	-2.92%	-0.27%	3.02%
1988	16.81%	18.27%	10.70%	10.19%
1989	31.49%	47.80%	16.23%	15.61%
1990	-3.17%	-2.57%	6.78%	8.13%
1991	30.55%	14.61%	19.89%	19.25%
1992	7.67%	8.10%	9.39%	8.65%
1993	9.99%	14.41%	13.19%	10.59%
1994	1.31%	-7.94%	-5.76%	-4.72%
1995	37.43%	42.15%	27.20%	22.81%
1996	23.07%	3.14%	1.40%	3.04%
1997	33.36%	24.69%	12.95%	11.39%
1998	28.58%	14.82%	10.76%	9.44%
1999	21.04%	-8.85%	-7.45%	-1.69%
2000	-9.11%	59.70%	12.87%	9.45%
2001	-11.88%	-30.41%	10.65%	5.85%
2002	-22.10%	-30.04%	16.33%	1.63%
2003	28.70%	26.11%	5.27%	10.01%
2004	10.87%	24.22%	8.72%	6.03%
2005	4.91%	16.79%	5.87%	3.02%
2006	15.80%	20.95%	3.24%	3.94%
Geometric Mean	10.10%	8.80%	5.85%	5.45%
Arithmetic Mean	12.03%	11.14%	6.17%	5.73%
Standard Deviation	20.13%	22.55%	8.57%	7.89%
Median	14.31%	11.74%	4.14%	4.45%

Tabulation of Risk Rate Differentials for
S&P Public Utility Index and Public Utility Bonds
For the Years 1928-2006, 1952-2006, 1974-2006, and 1979-2006

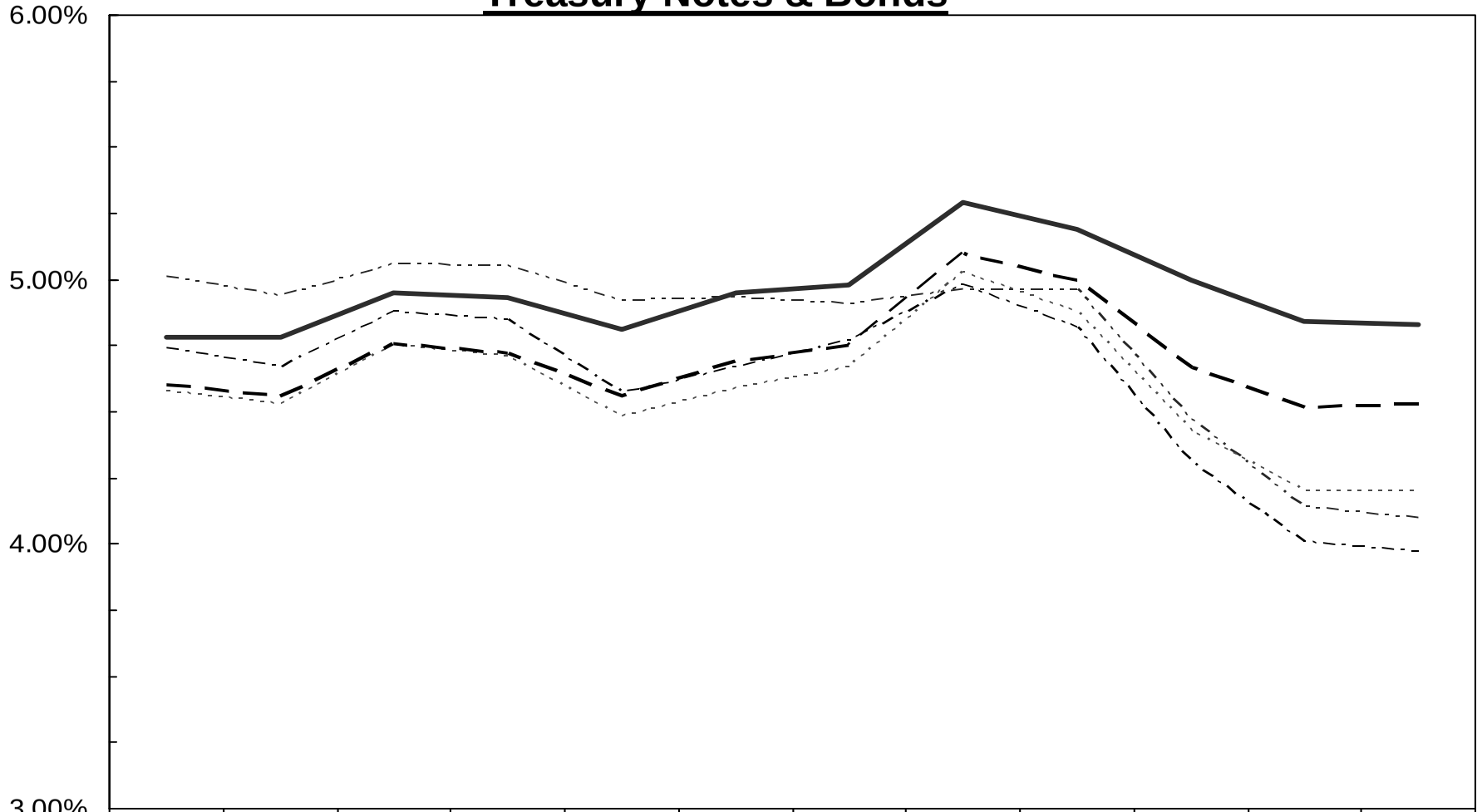
Total Returns	Range: Geometric Mean	Range: Median	Midpoint	Point Estimate: Arithmetic Mean	Average of the Midpoint of Range and Point Estimate
1928-2006					
S&P Public Utility Index	8.80%	11.74%		11.14%	
Public Utility Bonds	5.45%	4.45%		5.73%	
Risk Differential	3.35%	7.29%	5.32%	5.41%	5.37%
1952-2006					
S&P Public Utility Index	10.99%	13.58%		12.53%	
Public Utility Bonds	6.17%	4.94%		6.47%	
Risk Differential	4.82%	8.64%	6.73%	6.06%	6.40%
1974-2006					
S&P Public Utility Index	12.79%	15.08%		14.77%	
Public Utility Bonds	8.55%	8.65%		8.90%	
Risk Differential	4.24%	6.43%	5.34%	5.87%	5.61%
1979-2006					
S&P Public Utility Index	13.42%	15.94%		15.27%	
Public Utility Bonds	8.96%	9.05%		9.29%	
Risk Differential	4.46%	6.89%	5.68%	5.98%	5.83%

Value Line Betas

Gas Group	
AGL Resources, Inc.	0.85
Atmos Energy Corp.	0.85
New Jersey Resources Corp.	0.85
Northwest Natural Gas	0.90
Piedmont Natural Gas Co.	0.85
South Jersey Industries, Inc.	0.85
WGL Holdings, Inc.	0.85
Average	0.86

Source of Information:
Value Line Investment Survey
December 14, 2007

Yields on
Treasury Notes & Bonds



	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Jul-07	Aug-07	Sep-07	Oct-07
1-Year	5.01%	4.94%	5.06%	5.05%	4.92%	4.93%	4.91%	4.96%	4.96%	4.47%	4.14%	4.10%
2-Year	4.74%	4.67%	4.88%	4.85%	4.57%	4.67%	4.77%	4.98%	4.82%	4.31%	4.01%	3.97%
5-Year	4.58%	4.53%	4.75%	4.71%	4.48%	4.59%	4.67%	5.03%	4.88%	4.43%	4.20%	4.20%
10-Year	4.60%	4.56%	4.76%	4.72%	4.56%	4.69%	4.75%	5.10%	5.00%	4.67%	4.52%	4.53%
20-Year	4.78%	4.78%	4.95%	4.93%	4.81%	4.95%	4.98%	5.29%	5.19%	5.00%	4.84%	4.83%

Yields for Treasury Constant Maturities
Yearly for 2002-2006
and the Twelve Months Ended October 2007

Years	1-Year	2-Year	3-Year	5-Year	7-Year	10-Year	20-Year
2002	2.00%	2.64%	3.10%	3.82%	4.30%	4.61%	5.43%
2003	1.24%	1.65%	2.10%	2.97%	3.52%	4.02%	4.96%
2004	1.89%	2.38%	2.78%	3.43%	3.87%	4.27%	5.04%
2005	3.62%	3.85%	3.93%	4.05%	4.15%	4.29%	4.64%
2006	4.93%	4.82%	4.77%	4.75%	4.76%	4.79%	4.99%
Five-Year Average	2.74%	3.07%	3.34%	3.80%	4.12%	4.40%	5.01%
Months							
Nov-06	5.01%	4.74%	4.64%	4.58%	4.58%	4.60%	4.78%
Dec-06	4.94%	4.67%	4.58%	4.53%	4.54%	4.56%	4.78%
Jan-07	5.06%	4.88%	4.79%	4.75%	4.75%	4.76%	4.95%
Feb-07	5.05%	4.85%	4.75%	4.71%	4.71%	4.72%	4.93%
Mar-07	4.92%	4.57%	4.51%	4.48%	4.50%	4.56%	4.81%
Apr-07	4.93%	4.67%	4.60%	4.59%	4.62%	4.69%	4.95%
May-07	4.91%	4.77%	4.69%	4.67%	4.69%	4.75%	4.98%
Jun-07	4.96%	4.98%	5.00%	5.03%	5.05%	5.10%	5.29%
Jul-07	4.96%	4.82%	4.82%	4.88%	4.93%	5.00%	5.19%
Aug-07	4.47%	4.31%	4.34%	4.43%	4.53%	4.67%	5.00%
Sep-07	4.14%	4.01%	4.06%	4.20%	4.33%	4.52%	4.84%
Oct-07	4.10%	3.97%	4.01%	4.20%	4.33%	4.53%	4.83%
Twelve-Month Average	4.79%	4.60%	4.57%	4.59%	4.63%	4.71%	4.94%
Six-Month Average	4.59%	4.48%	4.49%	4.57%	4.64%	4.76%	5.02%
Three-Month Average	4.24%	4.10%	4.14%	4.28%	4.40%	4.57%	4.89%

Source: Federal Reserve statistical release H.15

Measures of the Risk-Free Rate

The forecast of Treasury yields
per the consensus of nearly 50 economists
reported in the Blue Chip Financial Forecasts dated January 1, 2008

Year	Quarter	1-Year Treasury Bill	2-Year Treasury Note	5-Year Treasury Note	10-Year Treasury Note	30-Year Treasury Bond
2008	First	3.4%	3.3%	3.6%	4.1%	4.5%
2008	Second	3.4%	3.4%	3.7%	4.1%	4.5%
2008	Third	3.5%	3.5%	3.8%	4.2%	4.6%
2008	Fourth	3.6%	3.6%	4.0%	4.4%	4.7%
2009	First	3.8%	3.8%	4.1%	4.4%	4.8%
2009	Second	3.9%	4.0%	4.2%	4.6%	4.9%

THE VALUE LINE Investment Survey®

Part 1 Summary & Index

File at the front of the *Ratings & Reports* binder. Last week's *Summary & Index* should be removed.

January 4, 2008

TABLE OF SUMMARY & INDEX CONTENTS

Summary & Index Page Number

SCREENS

The Median of Estimated
PRICE-EARNINGS RATIOS
of all stocks with earnings

17.6

26 Weeks Ago	Market Low 10-9-02	Market High 5-5-06
19.0	14.1	19.6

The Median of Estimated
DIVIDEND YIELDS
(next 12 months) of all dividend paying stocks under review

1.9%

26 Weeks Ago	Market Low 10-9-02	Market High 5-5-06
1.6%	2.4%	1.6%

The Estimated Median Price
APPRECIATION POTENTIAL
of all 1700 stocks in the hypothesized economic environment 3 to 5 years hence

50%

26 Weeks Ago	Market Low 10-9-02	Market High 5-5-06
40%	115%	40%

ANALYSES OF INDUSTRIES IN ALPHABETICAL ORDER WITH PAGE NUMBER

Numeral in parenthesis after the industry is rank for probable performance (next 12 months).

*Reviewed in this week's issue.

In three parts: This is Part 1, the Summary & Index. Part 2 is Selection & Opinion. Part 3 is Ratings & Reports. Volume LXIII, No. 19.
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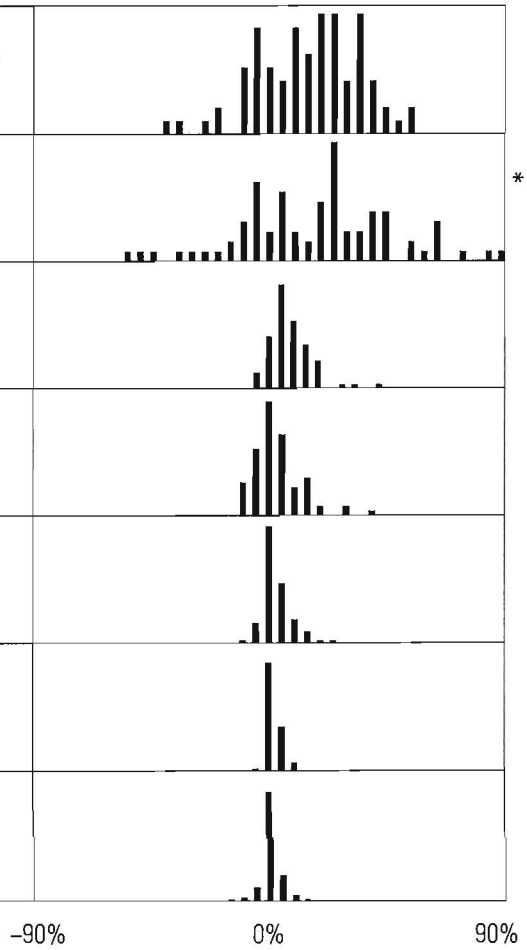
Table 2-1
Basic Series: Summary Statistics of Annual Total Returns

from 1926 to 2006

Series	Geometric Mean	Arithmetic Mean	Standard Deviation	Distribution
Large Company Stocks	10.4%	12.3%	20.1%	
Small Company Stocks	12.7	17.4	32.7	*
Long-Term Corporate Bonds	5.9	6.2	8.5	
Long-Term Government	5.4	5.8	9.2	
Intermediare-Term Government	5.3	5.4	5.7	
U.S. Treasury Bills	3.7	3.8	3.1	
Inflation	3.0	3.1	4.3	



*The 1933 Small Company Stocks Total Return was 142.9 percent.

Comparable Earnings Approach

Using Non-Utility Companies with
Timeliness of 3 & 4; Safety Rank of 1 & 2; Financial Strength of B+, B++ & A;
Price Stability of 90 to 100; Betas of .85 to .90; and Technical Rank of 3 & 4

Company	Industry	Timeliness Rank	Safety Rank	Financial Strength	Price Stability	Beta	Technical Rank
Avery Dennison	CHEMSPEC	4	2	A	90	0.90	3
Bank of Hawaii	BANK	3	2	B++	100	0.85	3
Campbell Soup	FOODPROC	3	2	B++	100	0.85	3
Cincinnati Financial	INSPRPTY	3	2	B++	100	0.85	3
City National Corp.	BANK	4	2	B++	95	0.85	3
Commerce Bancshs.	BANKMID	3	1	A	100	0.85	3
Int'l Flavors & Frag.	CHEMSPEC	3	2	B++	95	0.85	3
Mercury General	INSPRPTY	3	2	B++	95	0.85	3
Northrop Grumman	DEFENSE	3	1	A	95	0.85	3
Old Nat'l Bancorp	BANKMID	3	2	B++	90	0.90	3
Pitney Bowes	OFFICE	3	1	A	100	0.85	3
PNC Financial Serv.	BANK	3	2	B++	95	0.90	3
Regions Financial	BANK	4	1	A	95	0.90	3
Reinsurance Group	INSLIFE	3	1	A	95	0.85	4
Scripps (E.W.) 'A'	NWSPAPER	3	2	B+	95	0.85	3
Weis Markets	GROCERY	3	1	A	90	0.85	3
Whitney Holding	BANK	4	2	B+	90	0.90	3
Average		3	2	B++	95	0.86	3
Gas Group	Average	4	2	B++	100	0.86	3

Source of Information: Value Line Investment Survey for Windows, December 2007

Comparable Earnings Approach
Five -Year Average Historical Earned Returns
for Years 2002-2006 and
Projected 3-5 Year Returns

Company	2002	2003	2004	2005	2006	Average	Projected 2009-12
Avery Dennison	26.5%	20.1%	19.8%	22.3%	22.6%	22.3%	20.5%
Bank of Hawaii	11.9%	17.0%	21.3%	26.2%	26.3%	20.5%	19.5%
Campbell Soup	-	161.8%	74.7%	55.7%	38.5%	82.7%	31.0%
Cincinnati Financial	5.4%	6.2%	8.4%	9.2%	7.3%	7.3%	7.5%
City National Corp.	16.3%	15.3%	15.3%	16.1%	15.7%	15.7%	15.0%
Commerce Bancshs.	14.1%	14.2%	15.4%	16.7%	15.2%	15.1%	13.0%
Int'l Flavors & Frag.	32.0%	26.9%	21.5%	20.1%	23.6%	24.8%	26.5%
Mercury General	10.2%	14.1%	18.4%	15.1%	11.8%	13.9%	13.5%
Northrop Grumman	4.8%	4.8%	6.4%	7.4%	9.2%	6.5%	12.0%
Old Nat'l Bancorp	14.8%	9.8%	9.6%	12.1%	12.4%	11.7%	13.5%
Pitney Bowes	67.0%	52.3%	46.0%	48.1%	87.0%	60.1%	44.0%
PNC Financial Serv.	17.5%	15.5%	16.0%	15.5%	14.0%	15.7%	14.0%
Regions Financial	14.8%	14.6%	8.1%	9.4%	6.5%	10.7%	10.5%
Reinsurance Group	10.5%	8.5%	9.9%	8.9%	10.4%	9.6%	11.5%
Scripps (E.W.) 'A'	15.2%	13.6%	13.8%	13.6%	15.4%	14.3%	12.5%
Weis Markets	10.4%	9.5%	10.0%	10.5%	8.9%	9.9%	10.0%
Whitney Holding	11.9%	11.7%	10.7%	10.6%	13.0%	11.6%	10.0%
Average						20.7%	16.7%
Median						14.3%	13.5%