

Gas Distribution: Now a Higher-Risk Business

The rise in equity risk premiums for local gas utilities may come as a surprise.

By Mark Cicchetti

EQUITY RISK PREMIUMS FOR NATURAL GAS distributors have hit a ten-year high. Moody's Gas Distribution Index showed a jump to a 5.4 percent equity risk premium in December 2001 and has averaged an approximate five percent equity risk premium in 2002, while historically equity risk premiums have averaged 3.4 percent above the yield of 30-year Treasury bonds over the last 10 years. The variation in equity risk premiums over time and in relation to the level of interest rates, as shown in Figure 1, calls into question some commonly used analytical methods—particularly what is called the ex

Moody's Natural Gas Distribution Index—2002

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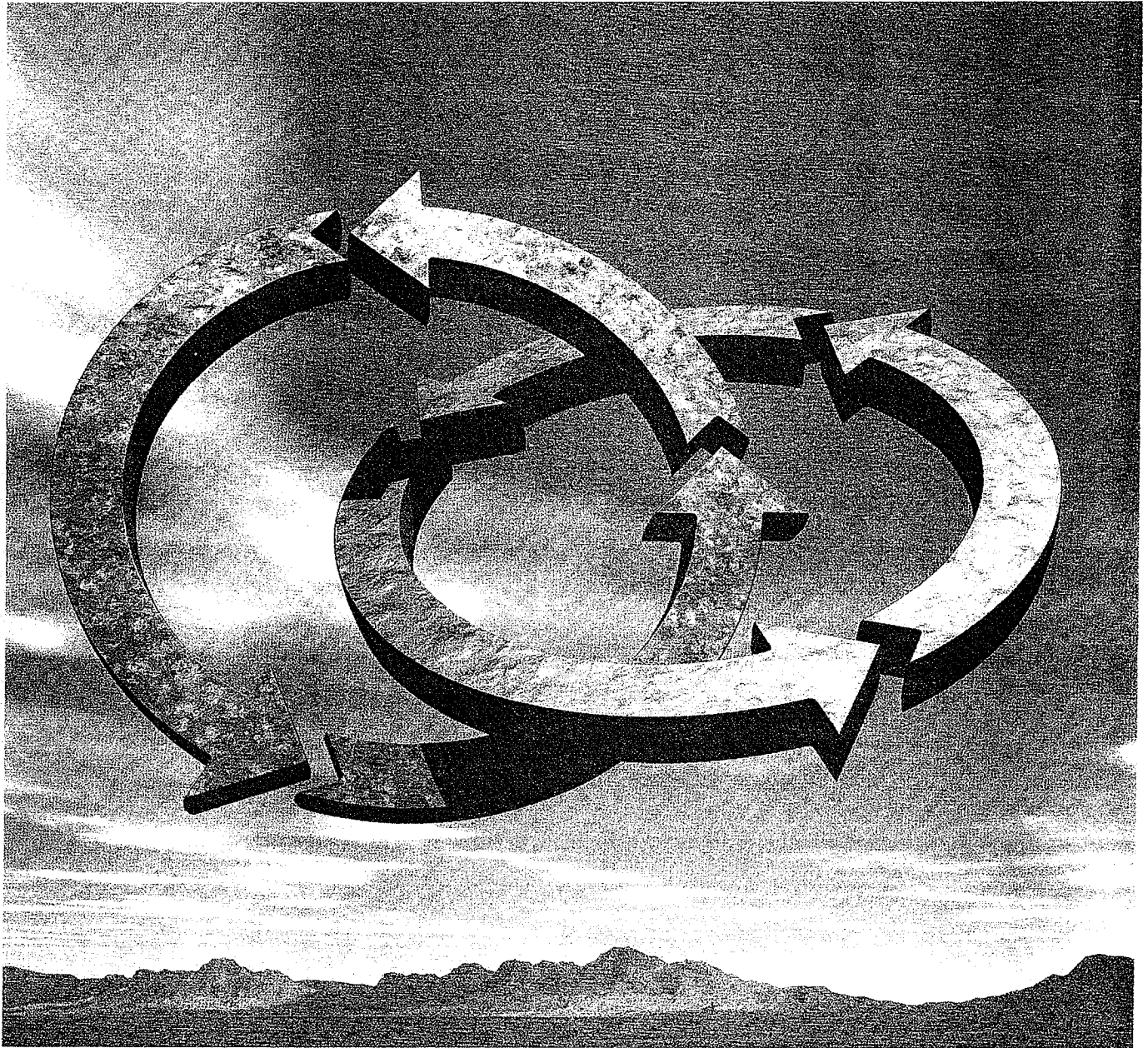
Keyspan Corporation

Laclede Gas

N. W. Natural Gas

Peoples Energy

WGL Holdings



post risk premium analyses, or historical yield spread method, which typically uses extremely long 60- to 70-year periods.

Notwithstanding its widespread use, there is a serious conceptual problem with using the ex post or historical yield spread method to determine risk premiums.

Typically, under the ex post method, the risk premium is calculated as the difference between the historical holding period returns on an index of stocks for a particular past period and the returns from an index of bonds for the same past period. The historical risk premium is then added to a

company's current bond yield or to the current yield of a Treasury security to determine the cost of equity.

This is expressed as follows:

$$K_e = K_d + \text{historical equity/debt spread}$$

where: K_e = cost of equity

K_d = cost of debt

But the cost of equity is a forward-looking concept. That is, the cost of equity is based on investor expectations, and not ex post performance. There is no reason to

Figure 1

Risk Premium Analysis

Moody's Natural Gas Distribution Index—Annual Averages, 1992-2002

Year	Gas Index Cost of Equity	Risk Free Rate	Risk Premium
1992	10.19	7.69	2.50
1993	9.00	6.70	2.30
1994	9.32	7.24	2.08
1995	9.60	7.04	2.56
1996	9.58	6.66	2.92
1997	9.83	6.65	3.18
1998	9.71	5.66	4.05
1999	10.10	5.76	4.34
2000	10.49	6.01	4.48
2001	9.99	5.49	4.50
2002*	10.52	5.65	4.87
Avg.	9.84	6.41	3.43

* Through July

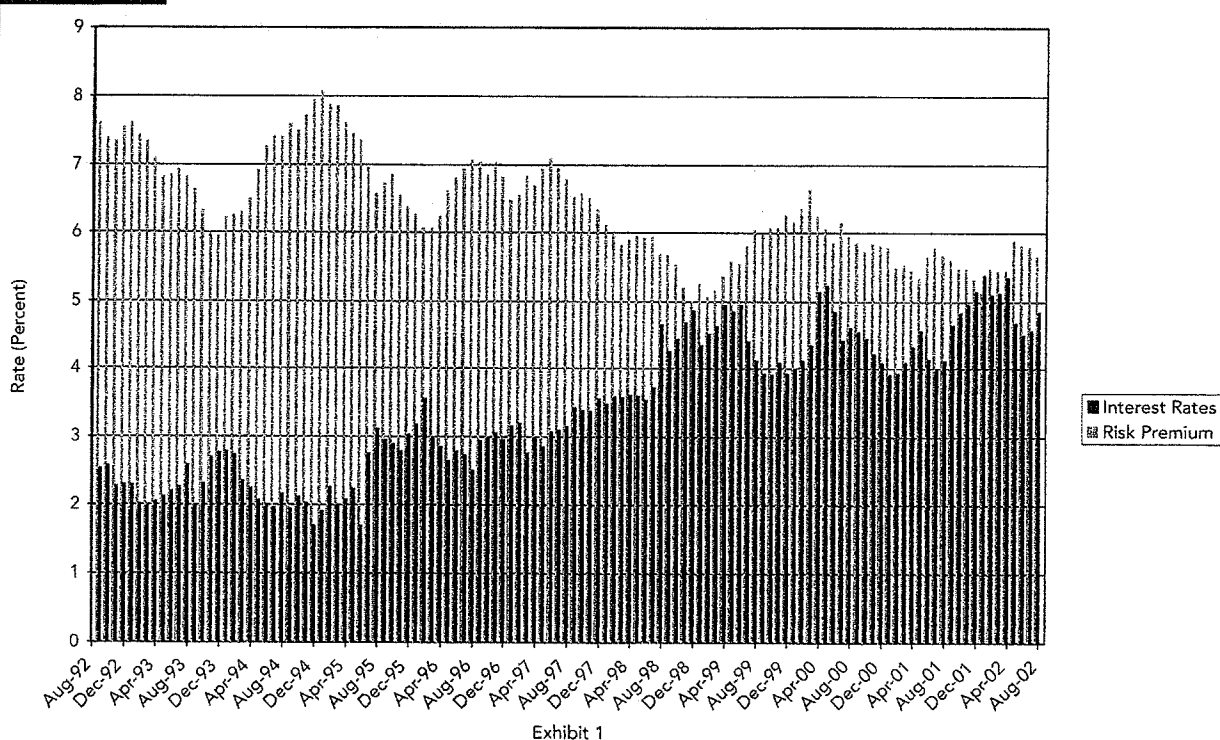
believe that investors expect future relative returns to be the same as those earned in the past. Actual performance may deviate substantially from what was expected, but it is expectations relative to requirements that will determine if an investment should be made. Simply because a company's stock returned either one percent or 500 percent over the cost of debt does not mean the company's cost of equity was either one percent or 500 percent over the cost of debt. Furthermore, ex post risk premium analyses typically incorporate negative risk premiums because there are many months and years when stock market returns are negative. It is illogical and contrary to financial theory regarding risk aversion and required returns to presume the cost of equity is negative or less than the cost of debt. Cost of equity analyses should be consistent with that type of financial theory.

Because it avoids some of the serious flaws of other approaches, an ex ante approach is the appropriate way to determine equity risk premiums. Under an ex ante approach, the required return on equity used to calculate equity risk premiums is determined using investor expectations, as opposed to relying on past returns.

For example, many analysts have established a 7.8 percent equity risk premium when analyzing the earned return on the S&P 500, as compared to those earnings of an index of

Figure 2

Comparison of Interest Rates and Risk Premiums



long-term government bonds dating back to 1926, as reported by Ibbotson Associates.¹

The validity of using ex post premiums determined in markets from long-ago periods is called into question, with improvements and advances in market efficiencies, portfolio theory, the creation of options and futures markets, financial regulations and reporting, and the increased availability and quality of investor information. The earned returns from long ago are simply not representative of today's markets.

The risk premium method of estimating the cost of equity is an intuitively appealing and widely used approach for determining the required return on common equity capital. Naturally, one might point out that a benefit of a risk premium analysis, particularly from a utility ratemaking standpoint, is that it uses a longer time-period perspective and is less vulnerable to a particular capital market environment. However, the methodology used to calculate equity risk premiums should be consistent with financial theory regarding risk aversion and required returns. Consequently, equity risk premiums should be calculated using an ex ante methodology over a period long enough to ensure the robustness of the analysis, but not so long as to be obsolete.

ROE: How Much Return for the New Risks?

The required return on equity for the 1992 to 2001 period for Moody's Gas Distribution Index can be determined using a non-constant growth, quarterly-compounded discounted cash flow (DCF) model:²

$$P_0(1-fc) = \sum_{t=1}^n \frac{Dt}{(1+k)^t} + \frac{D_n(1+gn)}{(k-gn)} * \frac{1}{(1+k)^n}$$

A two-stage model was used to take advantage of the explicit dividend forecasts that are available from *Value Line* (annual dividends for years one and four were given, while years two and three were interpolated). The long-term constant rate of growth was calculated using the earnings retention (b times r) method and *Value Line's* three- to five-year expected return on equity (r) and expected retention rate (b). The stock prices used were the average of the high and low prices for the relevant month. A three percent adjustment for flotation costs was included.

As shown in Figure 1, the equity risk premiums ranged from approximately two percent to 5.4 percent over the 10-year period. It is interesting to note that the premiums vary in relation to the level of interest rates, with the premiums being larger when interest rates are lower. Furthermore, in the current, low-interest rate environment, the risk premium for the index is approximately 500 basis points. The variation in pre-

miums relative to interest rates for the natural gas distributors are consistent with those found by Brigham, Shome, and Vinson³ for electric utilities and industrial companies.

In conclusion, the appeal of the risk premium method derives from its theoretic simplicity. Equity is riskier than debt because the return to equity investors is a residual return (i.e., equity investors are not paid until debt holders have been paid) and is less certain than the yield on bonds. Therefore, investors require a higher return on equity capital than on debt capital. By determining the premium required by investors for the additional risk associated with equity capital, the cost of equity can be estimated, given the required return on debt. **E**

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1 Ibbotson Associates' *Valuation Edition 2001 Yearbook*, page 65.

2 For ratemaking purposes, the return determined by a quarterly DCF calculation (the effective rate) may need to be adjusted to a nominal rate. See C.M. Linke, and J.K. Zumwalt, "Estimation Biases in Discounted Cash Flow Analyses of Equity Capital Cost in Rate Regulation," *Financial Management*, Autumn 1984, p. 15-21, and M. Cicchetti, "The Quarterly DCF Model, Effective and Nominal Rates of Return and the Determination of Revenue Requirements for Regulated Public Utilities," *National Regulatory Research Institute Quarterly Bulletin*, Fall 1989, p. 249-259.

3 See E.F. Brigham, D.K. Shome, and S.R. Vinson, "The Risk Premium Approach to Measuring a Utility's Cost of Equity," *Financial Management*, Spring 1985, p. 33-45.