

Linking Risk and ROE

Financial-risk coverage is falling short in utility returns

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When setting the allowed returns on common equity of jurisdictional utilities, state regulatory authorities apply the virtually universal standard that the allowed returns should be similar to returns on common equity investments in companies of equivalent risk.¹ Such returns generally are accepted as fair if they are no higher than necessary and still sufficient to attract investment. It follows that the greater the risk, the greater the required return, and that a return that meets the risk-equivalency standard will be sufficient for the utility to operate successfully, attract capital, maintain financial integrity and compensate investors for the risks they assume.

Despite the universality of this regulatory standard, our investigation of recent allowed returns by state commissions shows that a key risk—financial

risk—as measured by accepted, measurable metrics, has not been a factor affecting the level of allowed returns in the United States in recent years.

Financial Risk

Precedent claims on revenues to cover fixed-cost obligations are the source of financial risk. The benefits to common stock holders come from dividends, retained earnings, and stock price

appreciation. However, returns to common stock are available only after the utility makes all preferred stock and interest payments.

Generally, a lower equity ratio implies that a company has greater fixed-cost obligations to holders of securities that have precedence to revenues, which means that a lower common equity entails greater financial risk for the common-stock holders. Consequently, the common-equity percentage is a direct measure of financial risk.

Bond rating agencies acknowledge that they consider many factors, including the common equity ratio, when determining ratings. Bond ratings are another generally accepted measure associated with financial risk.²

A bond rating summarizes the raters' opinions regarding the security of the contracted interest payments, and, as previously stated, common-equity returns are subordinated to the interest payments. Additionally, the rating agencies have developed other measures of risk, such as the Flow of Funds from Operations to capital interest payments, which is a more direct measure of the funds available to meet interest payments. (A higher flow of funds from operations to interest payments ratio implies more funds will be available to common equity returns.)

For these reasons, common-equity ratios and bond ratings are both measurable metrics signifying levels of financial risk, and statistically we can isolate »

TABLE 1 REGRESSION RESULTS OF ALLOWED RETURNS

Utility Type	Risk Variable	a0	a1	a2	Adj R ²
Electric	CS Ratio (CS)	3.65	0.0626	0.612	0.448
		(4.02)	(6.01)	(6.00)	
	Bond Rating (R)	6.20	0.343	0.509	0.393
		(10.23)	(5.14)	(5.73)	
Gas	CS Ratio (CS)	5.595	0.037	0.491	0.261
		(5.98)	(3.99)	(4.07)	
	Bond Rating (R)	6.569	0.358	0.437	0.343
		(9.39)	(5.39)	(4.46)	

the relationship between them and the allowed returns by state commissions.

Econometric Analysis

To test the direct relationship of the financial-risk variables—namely the common-equity ratio and the level of bond ratings on the allowed return on common equity during this period—we estimated the following regression equations for the electric utility and the natural-gas distribution decisions:

$$(1) \text{ AROEe} = a_{0e} + a_{1e}\text{CSe} + a_{2e}\text{R} + e$$

$$(2) \text{ AROEe} = a_{0e} + a_{1e}\text{BR}_e + a_{2e}\text{R} + e$$

$$(3) \text{ AROEg} = a_{0g} + a_{1g}\text{CSg} + a_{2g}\text{R} + e$$

$$(4) \text{ AROEg} = a_{0g} + a_{1g}\text{BRg} + a_{2g}\text{R} + e$$

where: AROEe and AROEg are the allowed returns; CSe and CSg are the common stock equity ratios; BR_e and BR_g the bond ratings for the electric and gas utilities respectively; and R is the interest-rate variable.

In each of the equations the interest-rate variable serves as a scalar that isolates the financial-risk variables, and reveals more directly the statistical relationship between financial risk and the allowed return on common stock. In other words, we controlled for the influence of the level of interest rates on allowed returns when we quantified the relationship between financial risk and allowed returns. Based on the regulatory standard of allowed returns sufficient to attract investment, we hypothesized that interest rates, as representative of alternative investments, were directly or positively related to allowed returns. Based on financial theory, we hypothesized that the allowed returns negatively were related to levels of financial risk, as measured by either common-stock equity ratios or bond ratings.

When we estimated the four regression equations, the statistical results in each instance were very similar (see Table 1). For example, in both the electric and gas industries, the level of interest rates was, as we hypothesized, a statistically

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significant, positive influence on the level of allowed returns. Even though our data set is not a pure time series, the estimated results still suggest that the allowed rate of return significantly was influenced by changes in the level of interest rates over time. The changes in allowed returns were less than the changes in the level of interest rates, however. According to the parameter estimates of a_2 , for the electric utility industry, a 1 percent higher interest rate level translated into an estimated 0.51 percent to 0.61 percent higher allowed return on common equity. For the gas-distribution utilities, the estimated parameters indicated that a 1 percent higher interest rate resulted in an aver-

age increase in the allowed returns on common equity in the range of 0.44 percent to 0.49 percent.

The regression results linking allowed common-equity returns and financial risk did not conform to our hypothesis, however. Neither of the financial risk measures—*i.e.*, common stock-equity ratios nor bond ratings—significantly was related to the level of allowed common equity returns granted in these industries during this period. Contrary to our hypothesis based on financial theory, the relationship between the common-equity ratios and the allowed returns statistically was positive at a 99 percent level. Illogically, this result suggests that the allowed returns were generally higher for firms with lower financial risks, not the other way around. Our estimated results further indicated that for every one level increase in the bond rating, the allowed rate of return would be about 0.35 percent higher, rather than lower.

Risk-Return Gap

We identified common stock equity as a percentage of capital and bond ratings

BOND RATINGS AND EQUITY RATIOS

To test the relationship between the common equity ratios and bond ratings as compared with allowed returns, we identified 110 electric and 99 gas-distribution utility allowed return decisions in the 2001-2007 period. (Allowed return data were provided by Regulatory Research Associates).

To develop financial-risk data for this analysis, we associated the allowed returns in these decisions with the common-equity ratios approved in the decisions and the S&P bond rating of the utility at the time of the decision. If the utility, which is a subsidiary of a parent company, issues no rated debt in its own name, we used the bond rating of the parent in this analysis. For this analysis, we assigned the values from 1 to 5 accordingly to the bond rating levels from B to AA.

Because, in any year, the level of interest rates is likely to have a direct influence on the level of allowed returns, we introduced a bond interest rate variable to the analysis. To identify and remove the influence of the changing interest rates from the statistical relationship between financial risk and allowed returns on equity, we included the level of interest rates as an independent variable in our regression analysis. We used the “Baa” corporate bond rates at the date of the allowed return decision as the interest rate variable.—DM, ZZ and MK



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as measures of financial risk. Contrary to financial theory and the principle of setting returns associated with equivalent risks, we found no significantly negative relationship between allowed returns and the risk measures among the 209 allowed returns in gas and electric utility rate cases during the 2001-2007 period studied.

Although the policy implications of this finding are not readily apparent and require further investigation, these estimates indicate a current, conceptual gap between allowed returns granted and important, recognized risks. One obvious concern is the implications of these findings for raising capital for utilities if the regulatory process does not recognize apparent financial risks. For exam-

ple, virtually all reputable analysts are predicting major capital investment requirements for gas and electric utilities based on increasing demand, the need to replace older infrastructure, and meeting new environmental standards. Given increasing capital requirements, a reasonable policy question is whether the gap between identifiable risk and allowed return is sustainable. Linking allowed returns more precisely to investors' risks may become imperative if the predicted, incremental demand for equity capital becomes a reality. ■

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ENDNOTES

1. Frequently cited sources of this equivalent risk standard are two decisions by the United States Supreme Court: *Bluefield Water Works and Improvement Co. vs. Public Service Commission*, 262 U.S. 679 (1923), and *Federal Power Commission vs. Hope Natural Gas Co.*, 320 U.S. 591 (1944).
2. The bond rating organizations incorporate a number of risk indicators, including common equity and debt ratios, when determining a rating. For example, Standard & Poor's identifies funds from operations (FFO) to interest coverage ratio, FFO to total debt ratio and total debt to total capital ratio as important factors influencing bond ratings (see Standard & Poor's *Corporate Ratings Criteria* 2005, p.45, McGraw Hill, New York).