RISK AND RETURN FOR REGULATED UTILITIES

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RISK AND RETURN FOR REGULATED INDUSTRIES

THE Brattle GROUP

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described below rely on either a (1) regression analysis of some measure of the risk premium over bond yields against the level of bond yields, to assess the risk premium at different interest rates or (2) a simple average of the risk premium over a historical period. Several measures of the cost of equity may be used to calculate the risk premium with either approach, and different measures of the bond yield may be used as well.[2]

Throughout the discussion, it is important to remember that this approach is not based on a formal model of the cost of capital and has not been explored in the academic literature to the degree that other models have. Perhaps because of this, it sometimes is implemented in ways that overlook potentially serious conceptual problems. We address that issue after discussing the approach itself.

Regression Model

This method calculates the statistical relationship between some measure of the risk premium in the cost of equity for the regulated entities in question and an interest rate, to assess the risk premium that should be used at the current interest rate. Here we consider the allowed rate of return on equity (ROE) as the measure of the cost of equity, but other measures might be based on DCF estimates of the cost of capital, the realized market rates of return in the industry, or the realized accounting rates of return in the industry.[3] The horizon and periodicity relied upon is often dictated by the availability of the required data, in this example, for the allowed ROE. In the United States (US), quarterly data on allowed rates of ROE are readily available for electric and gas utilities, but not for other types of utilities.

Using this example of the methodology, the sample consists of the 10-year government bond yield and the historically allowed risk premium over that yield in each period, t, determined as:

$$Risk\ \ Premium_t = Allowed\ \ ROE_t - Treasury\ \ Bond\ \ Yield_t \qquad (6.2)$$

The following equation is then estimated for the sample period using standard regression techniques:

$$Risk\ \ Premium = A0 + A1 \times (Treasury\ \ Bond\ \ Yield) \qquad (6.3)$$

If the parameters are statistically significant, the equation can be used to assess what regulators in the relevant industry traditionally have allowed in terms of a risk premium over long-term bonds, $A0$, and to assess how the equity risk premium changes with the Treasury bond yield. Returning to Eq. (6.1), the estimated risk premium would then be added to the current or forecasted Treasury bond yield to result in the estimated ROE.

A regression of quarterly data from Regulatory Research Associates from Q1 1990 to Q4 2015[4] on the average quarterly yield on 10-year US Treasury bonds resulted in an intercept of 8.6% and a slope of negative 0.56, so that if

the forecasted yield on the long-term government bond were 5%, then the risk premium model would estimate an ROE of 10.8%, calculated as follows:

$$Estimated\ \ ROE = 5\% + (8.6\% - 0.56 \times 5\%) = 10.8\% \qquad (6.4)$$

In addition to being a method used by regulators to assess the cost of equity, the regression equation also shows that when long-term government interest rates change, the allowed ROE does not change one for one but by a lesser amount. This is readily seen in Fig. 6.1, which shows the regression line from Eq. (6.4). This version recognizes that the risk premium may be related to the level of interest rates in the economy instead assuming that the risk premium is constant over time.

The relationship between the ROE and (government or utility) bond yields is depicted in Fig. 6.2. The figure is illustrative only and rounds off the above regression to assume an intercept of 9% and an interest rate adjustment coefficient of −0.50.

The interest rate plus the risk premium equals the allowed ROE. The risk premium in the figure, the space between the allowed ROE and interest rate lines, shrinks by one-half of a percentage point for every percentage point the interest rate rises.

The result that the risk premium is inversely proportional to interest rates is not unique to this regression. Recall from Chapter 4 that one thread of the literature on the market risk premium reaches this conclusion.[5] Interpretation of this finding, however, must consider just what measure of the risk premium is being used.[6]

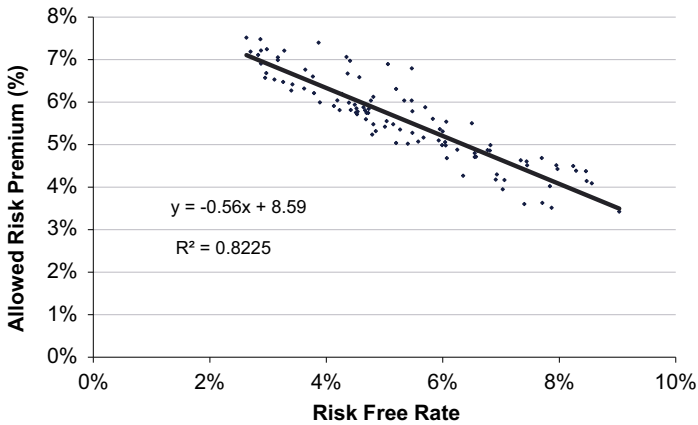

FIGURE 6.1 Relationship between utility allowed risk premium and long term government bonds: 1990−2015. *Source: Return on equity (ROE) from SNL Financial. Treasury yields from Bloomberg.*