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Challenges in Effectiveness Testing under FAS 133

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The requirement to assess hedge effectiveness in the Financial Accounting Standards Board's new statement on derivatives accounting, FAS 133, Accounting for Derivative Instruments and Hedging Activities, is critical for qualifying for "special" hedge accounting. But this requirement may be the most onerous of the statement because of the time and effort that is required to comply successfully. To the extent that companies can enter into hedges that are "highly effective," they can minimize earnings volatility. The degree of effort required to assess effectiveness depends on the complexity of the hedging relationships involved. This article illustrates the progression of effort required for relationships of increasing complexity and highlights the pitfalls associated with commonly employed methods (e.g., statistical regression) for assessing hedge effectiveness.

Effectiveness Assessment Approaches

1) *Is the Hedge Eligible for "Shortcut" Treatment?*
   Hedges that qualify for shortcut treatment require no ongoing hedge effectiveness assessments. However, the "shortcut" method is only available for hedging relationships involving interest rate swaps.
2) *Can the Hedge be Assessed Qualitatively as Having No Expectation of Ineffectiveness?*
   Many hedges that do not technically qualify for shortcut treatment because they do not involve interest rate swaps may otherwise be "perfect" and involve no timing or basis differences between the hedging instrument and the hedged item. While FAS 133 still requires a quarterly assessment of hedge effectiveness in these cases, assessment may require minimal effort. For example, Derivatives Implementation Group (DIG) Issue G9 permits certain assessments of hedge effectiveness to be *qualitatively* documented ("all the critical terms of the derivative match that of the hedged item"), with no quantitative methods necessary.
3) *If a Quantitative Method is Necessary, Is it Sufficient to Assess Effectiveness only at Inception?*
   In many cases, the company will know that, while the hedge relationship is not perfect, ineffectiveness is assuredly minimal. For example, hedge relationships with no basis differences but slight timing differences may make it highly unlikely that any movement in the relevant risk factor would be great enough to cause the hedge to fall out of an 80%–125% dollar offset corridor. If a source of ineffectiveness can be isolated in this manner, the company may not need to perform ongoing sophisticated statistical analyses to assess hedge effectiveness. However, the prospective analysis at the inception of the hedge should involve a quantitative effectiveness assessment.
4) *Evaluate the Efficacy of Potential Quantitative Methods for Assessing Effectiveness.*
   If a company's hedge relationship does not clearly fit in one of the above three categories, a company should then evaluate various quantitative methods for assessing hedge effectiveness. One option, if the hedge is not material into relationship to the financial statements taken as a whole, is to skip "special" accounting treatment altogether, especially in consideration of the comparative time and expense involved.

   For example, hedges that run for a relatively short period of time, such as four to six months, may affect only one reporting period. Quantitative assessment methods will be required for companies with either complex hedge relationships (such as portfolio hedges) or simple structures involving more than one source of ineffectiveness (either basis or timing differences). These are the types of hedges that on a cost-benefit basis are most likely to support the time, effort and expense required to maintain a quantitative approach to effectiveness assessment.

Pitfalls in Regression

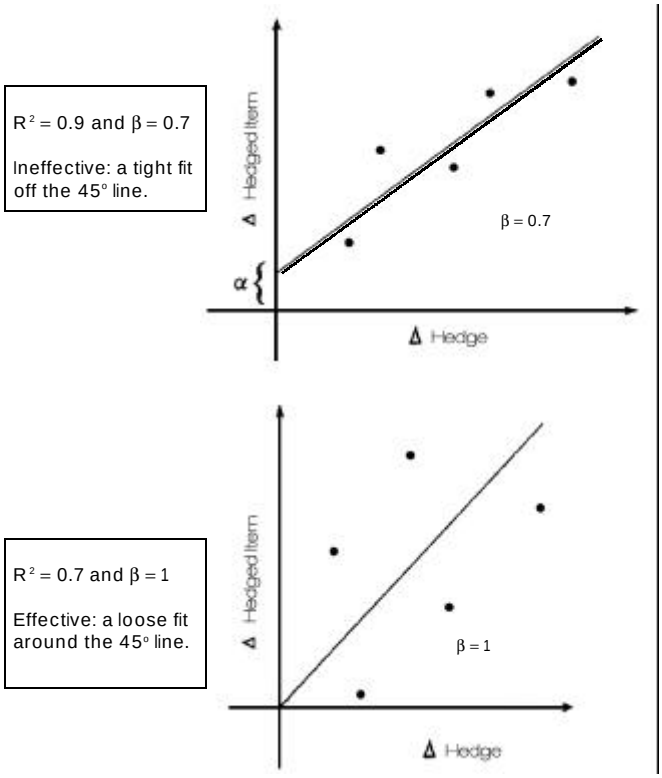
Paragraph 62 of FAS 133 "does not specify a single method for either assessing whether a hedge is expected to be highly effective or measuring hedge ineffectiveness" but does require "that an entity use that defined method consistently throughout the hedge period (a) to assess at inception of the hedge and on an ongoing basis whether it expects the hedging relationship to be highly effective in achieving offset and (b) to measure the ineffective part of the hedge." FAS 133 anticipates the use of tests to demonstrate that the hedge "offsets substantially all" of the variability in the hedged item. DIG Issue E7 states that effectiveness assessments "can be based on regression or other statistical analysis of past changes in fair values or cash flows as well as other relevant information."

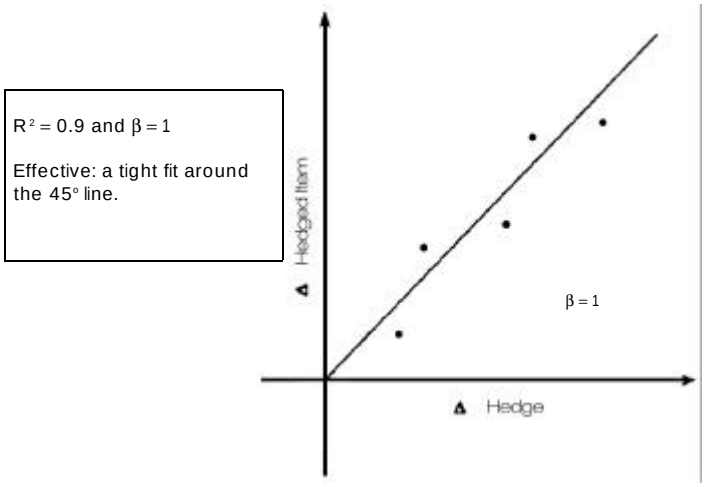
The statistical technique of regression fits observed changes in the hedged item to corresponding changes in the hedging instrument, as follows:

$$y = \alpha + \beta x + \varepsilon,$$

where *y* represents changes in the hedged item and *x* represents changes in the hedging instrument. The β coefficient, which the regression process determines, measures the degree to which *on average* the hedge offsets changes in the hedged item. A β value of 1 (i.e., the 45° line in the graphs shown below) indicates a one-to-one offset between the hedge and the hedged item. The α coefficient (or the intercept) measures changes in the hedged item that are unrelated to changes in the hedge. An α value of 0 indicates the absence of such effects. The ε coefficient captures unexplained variations in the hedged item. The R^2 value measures how closely the data points lie to the fitted line created by the regression. An R^2 value of 1 indicates that the regression "explains" 100% of the relationship between the hedging instrument and the hedged item.

A highly effective hedge, therefore, will exhibit a β close to 1, an α close to zero and an R^2 greater that 80%. The following three graphics vividly demonstrate the dangers involved in basing effectiveness assessments solely on either R^2 or β.





In addition, DIG Issue E7 recognizes that regression methodologies "require appropriate interpretation and understanding of the statistical inferences." While the graphs shown above are intentionally simplified for illustrative purposes, "appropriate" statistical interpretation requires a sufficient number of data points in order to be deemed "statistically significant." These may be difficult to amass for the retrospective evaluations of the type DIG Issue E7 contemplates. Further, the time steps separating the observed data points must correspond with the time steps of the hedge horizon (quarterly, since it is quarterly earnings that are presumably being hedged). Finally, overlapping (or rolling) data points may not be independent over time, creating autocorrelation problems.

A number of other observers have recognized the shortcomings of regression-based effectiveness approaches and have proposed solutions. For example, the *Volatility Reduction Measure (VRM)* of Andrew Kalotay Associates Inc. measures the reduction in variability achieved by adding the hedging instrument to the hedge item. Ira Kawaller and Paul D. Koch (*Journal of Derivatives,* Summer, 2000, p. 79) bless a similar method they refer to as "Alternative Method 1" in their paper on the subject. More recent enhancements to these variability-reduction methods employ Monte Carlo-based methods to assess effectiveness under a realistic range of possible outcomes. We expect practitioners to pursue further and refine innovative solutions to the effectiveness testing challenge as the FAS 133 implementation effort proceeds.

This week's Learning Curve was written by ***Rob Royall,*** *partner at Ernst & Young in New York and* ***Jay Glacy,*** *ASA, vice president at Gen Re—New England Asset Management in Farmington, CT.*