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BASICS OF HEDGE EFFECTIVENESS TESTING AND MEASUREMENT

This is the second paper in an ongoing series that outlines the principles of hedge accounting under current and expected International and U.S. accounting standards, including the practical challenges typically faced by organizations.

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ACCOUNTING TREATMENT MISMATCH

Under International and U.S. accounting standards, assets and liabilities not classified or designated as held for trading and measured at fair value through profit or loss are subject to measurement at amortized cost or fair value through Other Comprehensive Income (OCI). Derivative financial instruments, however, are always subject to measurement at fair value through profit or loss. As a result, an accounting treatment mismatch can occur when an organization uses derivative financial instruments (hedging items or hedging instruments) to hedge against exposures to a market risk arising from an underlying asset or liability that is not measured at fair value through profit or loss (hedged items). In these instances, the accounting mismatch is due to the different basis of accounting between the hedged item and the hedging instrument, giving rise to volatility in the income statement.

Hedge accounting is intended to deal with this accounting mismatch. By adjusting the basis of accounting for the hedged item (Fair Value Hedge) or the hedging item (Cash Flow Hedge), organizations can effectively use hedge accounting to reduce income statement volatility.

One of the critical requirements necessary to apply hedge accounting is the need to demonstrate that the hedge relationship will be (and has been) *highly effective* through the term of the relationship. *Highly effective* does not imply that the hedge needs to be perfectly effective; a certain amount of "noise" or ineffectiveness is permissible, as detailed further below.

WHAT IS HEDGE EFFECTIVENESS?

Hedge effectiveness is the extent to which changes in the fair value or cash flows of the hedging instrument offset the changes in the fair value or cash flows of the hedged item. Conversely, hedge ineffectiveness is the measure of the extent to which the change in the fair value or cash flows of the hedging instrument *does not* offset those of the hedged item.
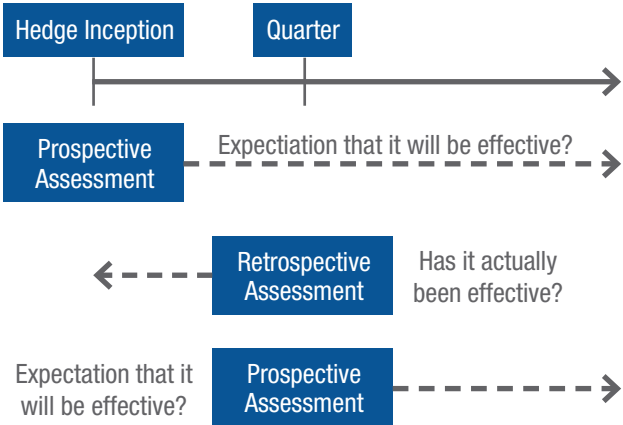
Under both International and U.S. accounting standards, there is a requirement to test hedge effectiveness on both a prospective and a retrospective basis. The prospective hedge effectiveness test is a forward-looking evaluation of whether or not the changes in the fair value or cash flows of the hedging item are *expected* to be highly effective in offsetting the changes in the fair value or cash flows of the hedged item over the term of the relationship. On the other hand, the retrospective hedge effectiveness test is a backward-looking evaluation of whether the changes in the fair value or cash flows of the hedging item *have been* highly effective in offsetting changes in the fair value or cash flows of the hedged item since the date of designation.

WHEN IS HEDGE EFFECTIVENESS TESTED?

At the inception of the hedge relationship (date of designation), an organization is required to run a prospective hedge effectiveness test to demonstrate an expectation of effectiveness in order to qualify for hedge accounting.

Periodically thereafter (at least quarterly under U.S. accounting standards, and at least every time financial statements are prepared under International accounting standards), an organization is required to perform a retrospective and a prospective hedge effectiveness test to demonstrate that the relationship has been effective since designation and is still expected to be effective over the remaining term of the relationship.

Prospective vs. Retrospective Assessment

Hedge Inception	Quarter

Prospective Assessment	Expectation that it will be effective?

	Retrospective Assessment	Has it actually been effective?

Expectation that it will be effective?	Prospective Assessment	

HOW IS HEDGE EFFECTIVENESS TESTED?

U.S. and International accounting standards permit an entity to assess effectiveness using either qualitative or quantitative methods. Qualitative methods are only permitted upon meeting strict prescribed criteria and allow an organization to assume a hedge is highly effective. On the other hand, quantitative methods (also referred to as "long-haul methods") rely on some form of quantitative analysis to support the conclusion of highly effective. While the accounting standards do not prescribe a particular type of quantitative method, an organization is required to develop an appropriate quantitative method consistent with the risk management policies/principles used to support the effectiveness of the relationship from an economic and business point of view.

1. QUALITATIVE METHODS OF HEDGE EFFECTIVENESS TESTING

Two prescribed qualitative methods to assess effectiveness include the *Critical Terms Match (CTM) method* and the *Short-Cut (SC) method*.

Critical Terms Match Method

Under the CTM method, the critical terms of the derivative hedging instrument must match perfectly with all the critical terms of the hedged item. Organizations only need to demonstrate this at inception and, as long as the critical terms continue to match each period thereafter, companies are permitted to conclude that the hedging relationship is highly effective.

Under current U.S. accounting standards, the CTM method can be used to support both prospective and retrospective hedge effectiveness tests. Under International accounting standards, however, the CTM method can only be used to support the prospective hedge effectiveness test.

The CTM method is not considered an appropriate method for the retrospective hedge effectiveness test due to the requirement under International accounting standards to explicitly consider counterparty credit risk in the valuation of the derivative hedging instrument. One would not be able to conclude that the relationship is perfectly effective even if the critical terms matched, as the change in the fair value of the derivative hedging instrument can never be expected to perfectly offset the change in the fair value of the hedged item (the fair value of the former is impacted by the changes in credit risk of the two counterparties, while the fair value of the latter is not, and only based on changes in fair value due to the hedged risk).

Short-Cut Method

Under the SC method, if a hedging relationship meets a prescribed set of very specific criteria, an organization can assume that the relationship is perfectly effective on both a prospective and retrospective basis. This method is only permitted under current U.S. accounting standards and is likely to be disallowed when the Financial Accounting Standards Board (FASB) issues a pending revised set of standards. In addition, the use of the SC method is also restricted to certain types of simplified hedging relationships against interest rate risk and therefore is not as accommodating. Accordingly, the use of the SC method is not a common practice and International accounting standards do not permit the use of this method under any circumstances.
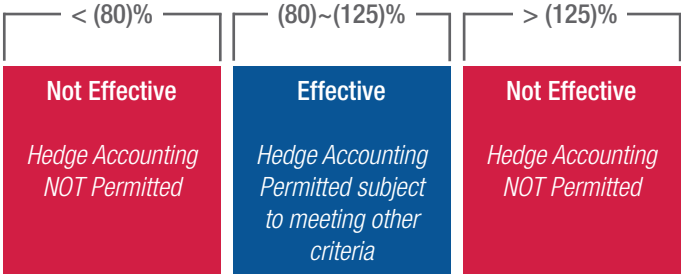
2. QUANTITATIVE METHODS OF HEDGE EFFECTIVENESS TESTING

When a relationship is not eligible to use a qualitative method to test effectiveness or when an organization chooses not to use a qualitative method, quantitative methods must be used to demonstrate hedge effectiveness. Two quantitative methods commonly used include the *Dollar Offset Method* and statistical *Regression Analysis*.

The Dollar Offset Method

The Dollar Offset Method involves comparing the ratio of the change in the fair value or present value of future expected cash flows of the hedging instrument with the change in the fair value or present value of future expected cash flows of the hedged item attributable to the hedged risk. This method can be performed either on a cumulative basis looking at the changes since the date of designation, or on a periodic basis looking at the changes since the last date the relationship was tested for hedge effectiveness.

The Dollar Offset Method

< (80)%	(80)~(125)%	> (125)%
Not Effective	**Effective**	**Not Effective**
Hedge Accounting NOT Permitted	*Hedge Accounting Permitted subject to meeting other criteria*	*Hedge Accounting NOT Permitted*

For the hedge relationship to be considered highly effective, the dollar offset ratio should be within the range of negative 80% to 125% (the negative indicating the offset). The Dollar Offset method can be used for both the prospective and the retrospective hedge effectiveness tests. For the prospective hedge effectiveness test, a simulation analysis is typically used to demonstrate that the dollar offset ratio is expected to be effective under a series of reasonably likely/possible changes in the hedged risk. For example, when hedging interest rate risk, simulations of the cumulative dollar offset ratio can be run under a series of reasonably likely interest rate movements. When the cumulative dollar offset ratio is within negative 80% and 125% under all scenarios, the relationship is considered to be highly effective on a prospective basis.

A potential disadvantage in using the Dollar Offset Method to assess hedge effectiveness is that this method could result in a failed effectiveness test when the dollar value of the changes being compared is small (typically referred to as "the small dollar effect"), even though by other measures the relationship may still be effective/valid. When entities have the necessary technical expertise, statistical methods are commonly used instead, as they are not susceptible to the small dollar effect.

Regression Analysis

A commonly used statistical method is the use of a Regression Analysis to demonstrate the strength of the relationship between two independent variables (in this case, the hedged item and the derivative hedging instrument).

This involves regressing the changes in the fair value or present value of future expected cash flows of the hedging instrument against the changes in the fair value or present value of future expected cash flows of the hedged item to determine a line of best fit and then assessing the goodness of fit of this line. In other words, the regression involves determining the *correlation* between the two variables by looking at the statistical parameters of the *slope* of the line and the coefficient of correlation of the regression (*R-squared*).

It is generally accepted that a *slope* parameter within a range of negative 0.80 to 1.25, and an *R-Squared* parameter equal to or greater than 0.80, is considered highly effective.

A Regression Analysis approach typically involves conducting a series of fair value simulations using historical market inputs (for instance, historical interest rate curves when hedging interest rate risk) to simulate changes in the hedged risk in the future periods over the term of the relationship. It is generally accepted that one should use historical inputs as approximately far back as the designated term of the hedge relationship in order for the analysis to appropriately demonstrate hedge effectiveness.

As this method uses the principles of statistical analysis as the basis to support a conclusion about hedge effectiveness, organizations need to ensure that the regression analysis is reasonable, appropriate and statistically significant. Potential issues to consider related to statistical significance include establishing the appropriate number of data points to regress (generally a minimum of 30 data points meets this requirement, though there can be other factors to support the use of fewer data points), as well as the absence of autocorrelation (a fundamental assumption of linear regression), which is why period-to-period changes in the fair value or cash flows are regressed rather than cumulative changes, as in the latter case subsequent data points in the time series are dependent on prior periods.

In those hedge relationships where the critical terms of the hedged item and hedging derivative instrument are not closely aligned, including due to credit risk factors (see further discussion below), the hedge cannot be expected to be perfectly effective (resulting in a dollar offset ratio other than negative 1.00 or a regression slope and R-squared of other than 1.00) and would result in some hedge ineffectiveness.

Depending on the degree of variance in the critical terms, changes in the hedged risk may cause the relationship to fall outside the accepted range to be able to conclude that the hedge is highly effective. If this happens, hedge accounting must be discontinued prospectively from the current assessment date should there be a failure of the prospective test, or discontinued prospectively from the previous assessment date should there be a failure of the retrospective test.

MEASURING HEDGE INEFFECTIVENESS

An organization applying hedge accounting is also required to measure any ineffectiveness that may exist in the hedge relationship. Ineffectiveness is the extent to which the change in the fair value or present value of future expected cash flows of the derivative hedging instrument does not offset those of the hedged item. For a Cash Flow Hedge, cumulative ineffectiveness is currently the *excess* of the cumulative change in the fair value or present value of future expected cash flows of the derivative hedging instrument over that of the hedged item (over-hedge). For a Fair Value Hedge, cumulative ineffectiveness is the *difference* between the cumulative changes in the fair value or present value of future expected cash flows of the derivative hedging instrument and the hedged item (over-hedge or under-hedge).

Notwithstanding the methods used to assess hedge effectiveness, *the cumulative Dollar Offset Method is always used to measure hedge ineffectiveness.*

THE IMPACT OF CREDIT RISK ON THE EFFECTIVENESS TESTS

Under U.S. accounting standards, the credit risk of either the organization (when a liability) or the counterparty (when an asset) is required to be considered in the valuation of the derivative hedging instrument in a Fair Value Hedge when applying quantitative methods of hedge effectiveness testing. However, certain qualitative methods are also commonly used to assess the impact of credit risk on the derivative hedging instrument in Cash Flow Hedges.

Under International accounting standards, the credit risk of either the organization (when a liability) or the counterparty (when an asset) is required to be considered in the valuation of the derivative hedging instrument in both Fair Value Hedges and Cash Flow Hedges when running hedge effectiveness tests.

Determining the impact of credit risk and incorporating it in the valuation of a derivative instrument can be complex and it is always recommended that organizations discuss this aspect of the requirements with their advisors prior to applying hedge accounting.

CONCLUSION

The assessment of effectiveness and measurement of ineffectiveness is typically the most resource intensive and sometimes underestimated aspect of qualifying for and maintaining hedge accounting. Due to the requirement to demonstrate effectiveness periodically, there is a need for organizations to ensure appropriate resources and expertise are available to perform the necessary analysis on a timely basis over the term of the relationship.

Timeliness of the effectiveness test is also critical – similar to the need to have contemporaneous documentation supporting a hedge relationship, the effectiveness assessment has to be conducted promptly each quarter or as per the applicable periodic interval. In addition, designing and sufficiently documenting the appropriate effectiveness test methodology is a critical requirement.

Entities wishing to apply hedge accounting are therefore encouraged to consult with their advisors to ensure this aspect of the requirements is appropriately considered before the relationship is executed. The penalty for getting this or any aspect of the requirements wrong is potentially the disqualification of hedge accounting from inception of the relationship which may have serious and material implications from a financial reporting and business perspective. However, with the right resources and technical expertise, application of hedge accounting is quite possible, resulting in the better alignment of the financial reporting and economics of an organization's hedge relationships.

The next paper in the series is titled "Basics of Credit Value Adjustments and implications for the Assessment of Hedge Effectiveness" and will provide further insight on credit value adjustments and how and when they are incorporated in the hedge effectiveness tests.

About KPMG

KPMG is a global network of professional firms providing Audit, Tax and Advisory services. KPMG operates in 150 countries and has 138,000 people working in member firms around the world. The independent member firms of the KPMG network are affiliated with KPMG International Cooperative ("KPMG International"), a Swiss entity. Each KPMG firm is a legally distinct and separate entity and describes itself as such.

About FINCAD

Founded in 1990, FINCAD provides advanced modelling solutions built on award-winning, patent pending technology. With more than 4,000 clients in over 80 countries around the world, FINCAD is the leading provider of financial analytics technology, enabling global market participants to make informed hedging and investment decisions. FINCAD provides software and services supporting the valuation, reporting and risk management of derivatives and fixed income portfolios to banks, corporate treasuries, hedge funds, asset management firms, audit firms, and governments. FINCAD Analytics can be accessed through Excel, MATLAB, as a Software-as-a-Service or embedded into an existing system through software development kits. Now, over 70 FINCAD Alliance Partners embed FINCAD Analytics within their solutions. FINCAD provides sales and client services from Dublin, Ireland, and Vancouver, Canada.

Note: Organizations should consult the appropriate financial accounting standards prior to applying hedge accounting. These include International Accounting Standard 39 – Financial Instruments: Recognition and Measurement, and in the U.S. Accounting Standards Codification 815 – Derivatives and Hedging. This article is for information purposes only and is not intended to prescribe in detail how to meet the requirements for hedge accounting under International or U.S. accounting principles. In addition, an entity's accountants should be involved in any assessment regarding the application of hedge accounting.

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