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Option Hedging Strategies under FAS 133

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Originally issued in April 2001 and finalized in August, FASB Staff FAS 133 Implementation Issue G20, *Assessing and Measuring the Effectiveness of a Purchased Option Used in a Cash Flow Hedge*, eliminates FAS 133's bias against option hedging. Prior to G20, changes in the time value of option hedges were reported in earnings. The result was not only unpredictable earnings volatility but also additional reporting complexity and confusion.

With G20, the true economic gain or loss from the option, net of the premium, is recognized in earnings only at the maturity of the underlying forecasted exposure. For the first time, U.S. GAAP reflects the economic advantages of option hedging, supporting sounder risk management. This article explores these issues associated with option hedging under FAS 133:

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- The advantages of options vs. forward contracts
- How to apply G20 to cash flow option hedges, including techniques for managing imperfect option P&L ineffectiveness
- Situations where using the ¶63(a) time value exclusion may be better than applying G20
- How GTA corporate FX benchmarking data supports the conclusion that an active option hedging strategy is not only a mainstream FX hedging practice, but also is more conservative and economically superior than a "buy and hold" option hedging strategy.

Please note that all paragraph references (¶) are to FAS 133, as amended and interpreted, and all alphanumeric references, e.g., E18, refer to the 133 Implementation Issues, available at www.fasb.org under Technical Projects and then under Derivatives Implementation Group.

Option Hedging vs. Forward Contracts

Forward contract hedging will be always the first instrument of choice in any FX hedging strategy. It does eliminate FX rate volatility, but it has significant disadvantages. Compared with option hedges of forecasted exposures, options are much better than forwards when there are losses on the forwards. On the other hand, when forwards have gains, at-the-money options are equal to the forward gain less the premium.

Options also generate less P&L volatility when the underlying hedged forecast is in error. If there is a forecast error, all that can be lost is the option premium, whereas the loss is potentially much larger on a forward contract hedge. Often, the same unfavorable economic conditions that cause forecast shortfalls also adversely impact foreign exchange hedges.

Finally, options have a clear advantage over forwards in relation to changes in accumulated other comprehensive income (AOCI). The maximum decrease in equity resulting from the fair valuation of the option is the option premium, whereas forward hedging can result in significant reductions (and volatility) in equity.

FAS 133 Option Hedge Accounting

Except for rare circumstances when they are used to hedge embedded purchased options under ¶20.c, FAS 133 requires that written options must be fully marked-to-market, with gains and losses recorded in earnings and no AOCI deferral. In ¶20(c)(1), the FASB states, “A combination of options (e.g., an interest rate collar) entered into contemporaneously shall be considered a written option if, either at inception or over the life of the contracts, a net premium is received in cash or as a favorable rate or other term.”

Provided that the effectiveness tests are passed, FAS 133 allows hedge accounting for single purchased options and net purchased options, i.e., combinations of purchased and written options, including zero cost collars. In E2 and E5, a net purchased option is defined as a combination of options that satisfies these four conditions at all times:

1. No net premium is received.
2. The components of the combination of options are based on the same *exact* underlying (i.e., the exact index, see also G22).
3. The components of the combination of options have the same maturity date.
4. The written option component’s notional is not greater than the notional amount of the purchased option component (see also E18).

G20 allows the calculation of effectiveness using a hedging instrument’s “terminal value,” its expected future pay-off amount at maturity. G20 states that if the hedging instrument is “(a) ... a purchased option or a combination of only options that comprise either a net purchased option or a zero-cost collar, (b) the exposure being hedged is the variability in expected future cash flows attributed to a particular rate or price beyond (or within) a specified level (or levels), and (c) the assessment of effectiveness will be based on total changes in the option’s cash flows (that is, the assessment will include the hedging instrument’s entire change in fair value), the hedging relationship may be considered to be perfectly effective (resulting in recognizing no ineffectiveness in earnings) if the following conditions are met:

1. The critical terms of the hedging instrument (such as its notional amount, underlying, and maturity date, etc.) completely match the related terms of the hedged forecasted transaction (such as the notional amount, the variable that determines the variability in cash flows, and the expected date of the hedged transaction)
2. The strike price (or prices) of the hedging option (or combination of options) matches the specified level (or levels) beyond (or within) which the entity’s exposure is being hedged.
3. The hedging instrument’s inflows (outflows) at its maturity date completely offset the change in the hedged transaction’s cash flows for the risk being hedged
4. The hedging instrument can be exercised only on a single date, its contractual maturity date.”

Condition 4 requires a European-style option. It does not restrict, as we discuss later, unwinding or selling an option prior to maturity.

Hypothetical Effectiveness Testing

Prior to G20, nearly all non-vanilla or exotic options were not acceptable FAS 133 hedges because their payoffs were too non-linear to satisfy the effectiveness tests. However, when an option fails any of the four G20 conditions above, G20 provides for effectiveness testing between the actual option and a “hypothetical derivative” that does satisfy all of the four G20 conditions. So defined, the hypothetical is a 100% effective hedge of the underlying exposure.

This will make more imperfect options acceptable 133 hedges because the effectiveness tests will be comparing the pricing of one kind of option with that of another kind, and they should be more closely related. There are two major ways of constructing the imperfect option hedge to make it highly effective and minimize P&L ineffectiveness.

First, G20 requires that the hedge documentation must state “... the specified level (or levels) beyond (or within) which the entity’s exposure is being hedged.” By examining the impact of hypothetical options with different strike prices against the actual derivative, we may be able

to construct the exposure — and thus the hypothetical — in such a way as to be a more highly effective 133 hedge with less P&L effectiveness.

Second, we can minimize ineffectiveness by documenting the hedge so that the notional amount of the actual derivative is less than the specified forecast exposure. This often results in a cumulative change in the fair value of an actual derivative that is smaller than the cumulative change in the larger hypothetical. If so, the actual derivative gain or loss is 100% deferred into AOCI. However, increasing the notional amount of the forecasted exposure may increase forecast error risk. Conversely, reducing the notional size of the actual derivative may be underhedging the true economic risk.

However defined, the documented hedge must first be a highly effective hedge. The two common methodologies are the 80-120/125% dollar-offset ratio effectiveness test and statistical analysis, which are both discussed in E7 and E8. The 80-120/125% test should be the first choice to try. It mirrors the P&L ineffectiveness calculations, and is a weak test, providing a wide 20-25% margin of imperfection.

Statistical analysis generally does not work well with option discontinuity. A better second method is the value-at-risk approach described in an article by Andrew Kalotay and Leslie Abreo, *Testing Hedge Effectiveness for FAS 133: The Volatility Reduction Measure* (Bank of America, Journal of Applied Corporate Finance, Winter 2001, which may be downloaded at www.kalotay.com).

Managing P&L Ineffectiveness

If the documented imperfect option hedge is highly effective, FAS 133 requires that ineffectiveness be reported in the P&L. For cash flow hedges, the “lesser of the two cumulatives” methodology is used to calculate the difference between the cumulative change in the fair value of the actual derivative and the cumulative change in hypothetical (§140).

Depending upon the notional amounts involved and actual and hypothetical options’ strike price(s), this difference could be small or very large. An increasingly common technique is modeling the P&L ineffectiveness in a value-at-risk (“VaR”) manner. This will estimate the maximum P&L ineffective-

ness amount that *might* be reported in a given accounting period with 95% confidence.

In practice, the process is first to evaluate various hypothetical derivatives against various actual derivative(s). The objective is to find which combination of option parameters has the lowest VaR estimate of P&L ineffectiveness. If the VaR estimate of P&L ineffectiveness risk is satisfactory, then we check to make sure that the hedge is highly effective. Otherwise, further modeling is needed.

When to Use Non-G20 Option Accounting

In her article, *Why Some Hedgers May Opt out of G20* (FAS 133.com, August 13, 2001, currently available at www.fas133.com), Helen Kane notes that some companies, especially those that are valued more on revenue growth than earnings, dislike the G20 requirement to amortize 100% of the option premium to the P&L all at once. These companies also dislike netting the AOCI reclass against the same P&L line item as the underlying hedged item. For example, for an option revenue hedge that expires out of the money, the expense is netted in the revenue line. Of course, for an in-the-money option, the net option gain would go to the revenue line.

For those with these considerations, the ¶63(a) exclusion of time value is the only alternative. As we will see below, this exclusion of time value is also useful when there is substantial uncertainty about the timing of the forecast exposures. However, please note that ¶62 requires that similar hedges have the same effectiveness tests. Unfortunately, one cannot use G20 for some option hedges and not others.

Under ¶63(a), an option’s time value is equal to the option’s fair market value less intrinsic value. Changes in time value are excluded from effectiveness tests must be reported immediately in P&L. Using one of two possible definitions (see E19), intrinsic value is the difference between the strike price and the current spot price times the notional amount, but never can be negative.

If the underlying exposure is hedged for changes in value on a spot-to-spot basis (§165-172), then changes in intrinsic value perfectly

offset changes in the hedged exposure and thus are 100% deferred in AOCI. The hedge is perfectly effective because when you do the algebra to calculate changes in intrinsic value, the strike price drops out, simplifying to the spot-to-spot change (§162).

This “dual-spot” method is useful when there is substantial uncertainty concerning the timing of the hedged exposure. Not all forecasted transactions can be predicted confidently to occur within a specified month. §460 describes a common interest rate hedging situation in which an exposed transaction is forecasted to occur within a six-month period. G16 has an example of a forecasted foreign exchange exposure occurring within a five-year period.

When the maturity of the underlying exposure (e.g., any time within 2002) is not the same as the maturity of the option hedging it (e.g., June 30, 2002), FAS 133 requires highly effectiveness testing and reporting hedge ineffectiveness to the P&L. This creates the practical problem of how to determine the change in value of a forecast that can occur any time in the specified period.

In these situations of substantial timing uncertainty, we can get 100% hedge effectiveness by documenting the option hedge as protecting the underlying exposure from changes on a spot-to-spot basis. Whether a forecasted exposure is expected to occur in the next month or in three years, the change in the spot-to-spot value of the forecast is the same. We then compare it to the change in intrinsic value, and as shown above, it is a 100% effective hedge.

Option Hedging Strategies

The economics of option hedging are fundamentally different from those of forward-contract hedging, where a buy-and-hold the forward contract strategy is nearly universal. The option hedger buys the option with the view that the option will go out of the money, and the option is providing downside protection in case it does not. However, if the option goes increasingly out-of-the-money, it provides less and less protection against possible rate reversals. This increased risk needs to be managed.

For example, consider an original ATM 50 delta option hedge that is now a 25 delta. In other words, the spot rate has moved in the hedger's favor, and there is a large unrealized gain on the underlying exposure. If foreign exchange rates unfavorably reversed 5%, there is an immediate incremental 5% unrealized loss on the exposure. However, this 5% loss is offset by only a 1.25% (= 25% of 5%) gain on the option. Regardless of what FAS 133 may say about this, no risk manager can claim to have an effective economic hedge.

By selling the option *and* replacing it with a forward, the active option hedger achieves three benefits:

- Overall option premium expense decreases, recouping the remaining time value of the original option.
- The unrealized gain on the underlying position is locked in with the forward, eliminating subsequent foreign exchange risk.
- With the passage of time, revised forecasts of the underlying exposure are likely to be more accurate, making forward contract hedging more appropriate.

Risk managers who remain confident of their original currency view will also evaluate an option roll-up strategy. This would entail selling the option and replacing it with another option with a closer strike (i.e., a higher delta) rather than replacing the option with a forward.

Another hedging practice to consider is using options to hedge to the expected forecasted *sale or purchase* date. Then, when the option is replaced with a forward, document the new forward as a hedge of the expected *payment* date, following the accounting described in H15.

Actual US Corporate Option Hedging

In 1998-2000, Greenwich Treasury Advisors benchmarked the pre-FAS 133 foreign exchange hedging practices of 50 American multinationals with average sales of \$22 billion, ranging from \$1.3 billion to \$175 billion. We found that 56% were option users, and of these option users, slightly

more than half would sell their options prior to maturity.

So, while option hedging is clearly a mainstream hedging practice, given the above economic arguments, why weren't there more option hedgers? And more option sellers? A major cause was the uncertainty and inconsistency of U.S. GAAP prior to FAS 133:

- Options, but not forwards, were acceptable hedge instruments for unbooked third party firm commitments.
- However, some auditors could be persuaded to allow options to hedge forecasts, including forecast interco FX transactions. Some would even allow forward contracts, but would often restrict it to intra-fiscal year hedging.
- A company that sold too many options prior to maturity risked having its entire option hedging portfolio viewed as a trading portfolio. As such, it would be marked-to-market and reflected immediately in earnings.

Thus, a pre-FAS 133 practice of selling an option hedge of a forecasted intercompany exposure and replacing it with a forward required persuading an auditor to permit deferral accounting of forward contract hedges of intercompany exposures and not marking-to-market all of the option hedges as trading. This was often a tough sale.

Under these circumstances, it is not surprising that 44% of the American companies benchmarked weren't even using options. What is truly remarkable — and what gives great credence to the economic arguments presented above — is that over 50% of the U.S. option hedgers were willing to sell their options prior to maturity anyway.

FAS 133 Rationalizes US GAAP

FAS 133 explicitly allows hedging forecasted intercompany FX transactions with any kind of derivative and allows terminating the hedges at any time. In ¶32, when a company voluntarily terminates a cash flow hedge or sells the hedging derivative, the deferred gain or loss in AOCI remains in AOCI until the underlying exposure is recognized in P&L. ¶32 goes on to explicitly state

that the underlying exposure can be immediately re-hedged with a new derivative.

So, under FAS 133 with G20, pure risk management considerations, not accounting, now drive the choice of using options, replacing existing hedges with more effective hedges, and developing more complex option hedging strategies. Already, we are seeing more US multinationals becoming sophisticated option users, moving beyond European options to average rate and double-average rate options and from collars to seagull strategies.

Jeff Wallace gratefully acknowledges the thoughtful comments of Keith Bergman of Wall Street Systems, Helen Kane of Hedge Trackers, Wiley Pickett of Ford Motor Company, and Mark Veale of Deutsche Bank. Any errors and all interpretations are his sole responsibility. He welcomes your comments or questions at jeff.wallace@greenwichtreasury.com.

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Preview of Next Issue

GTAnet #3 will discuss two little known but powerful treasury techniques: non-recourse in-house bank factoring and how to achieve Pan-European cash consolidation with your existing intercompany netting system.

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