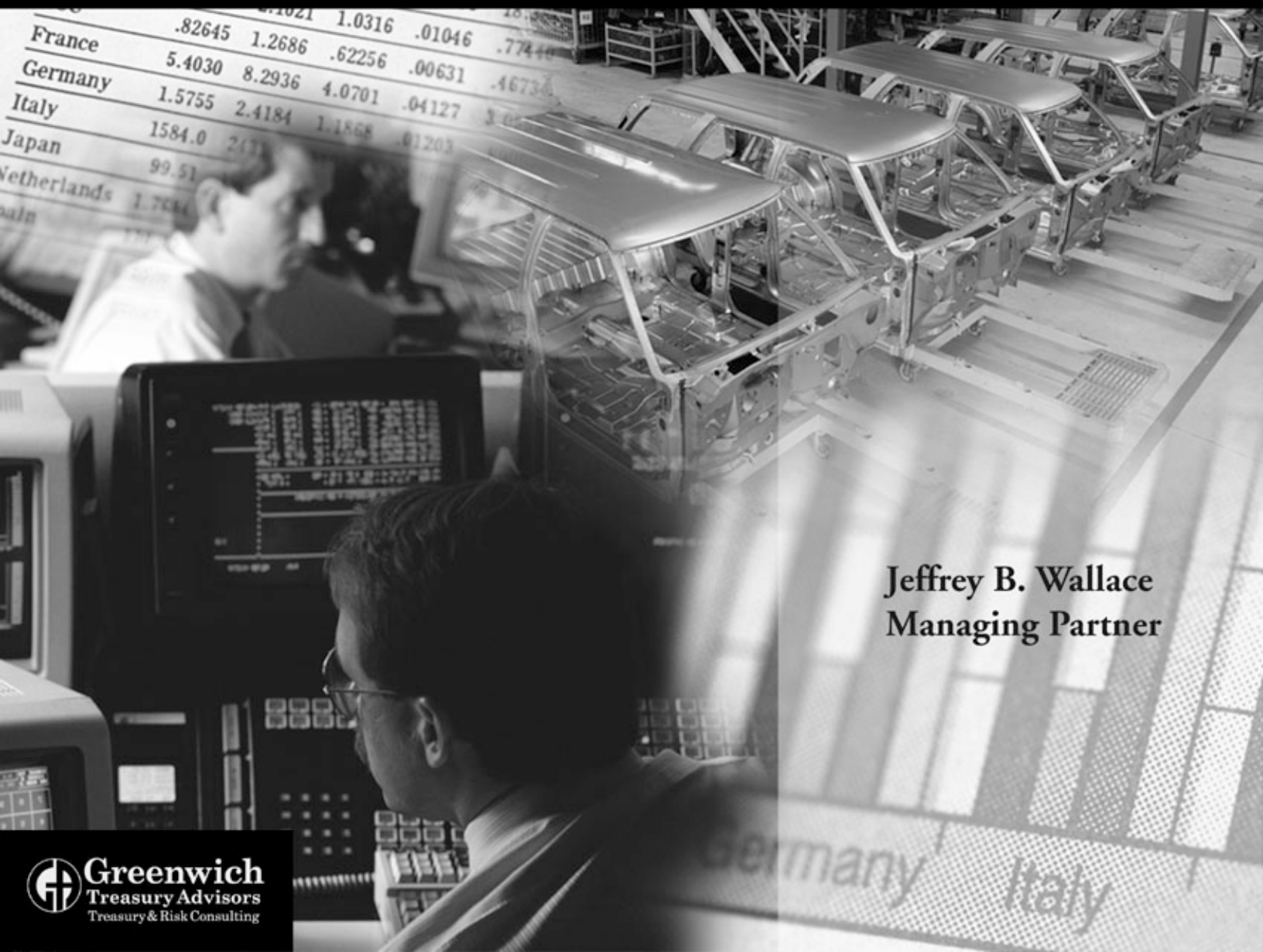


Derivative . Accounting & HEDGING UNDER FAS 133



	.82645	1.2686	1.0316	.01046	.77440
France	5.4030	8.2936	.62256	.00631	.46734
Germany	1.5755	2.4184	4.0701	.04127	3.0000
Italy	1584.0	213.0	1.1868	.01203	
Japan	99.51				
Netherlands	1.7684				
Spain					

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DERIVATIVE ACCOUNTING & HEDGING UNDER FAS 133

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1. INTRODUCTION

FAS 133 is a substantial body of work, reflecting the inherent complexity of derivatives and the enormous range of possible hedging situations. It also reflects a Darwinian evolutionary process. The hedgers and their advisors repeatedly create hedges and derivative-like instruments structured to take maximum advantage of FAS 133's ambiguities and exceptions, with two amendments and 175 Derivative Implementation Group (DIG) issues evolving to fix the holes being exploited. As a result, the Financial Accounting Standards Board's latest FAS 133 compendium, the "Green Book," encompasses 800 pages.

Many of the Green Book pages, however, deal with limited exceptions to the general concepts of FAS 133. We will develop those general concepts by first summarizing the historical developments related to FAS 133 and why it is such a revolutionary document. The basic concepts of FAS 133 are then introduced: the overall framework, the derivative definition, the three different hedge types, hedge documentation, effectiveness testing, and termination risk. The three important exceptions to the effectiveness tests are then reviewed as well as the rules surrounding option hedging. We end with a review of the ways to minimize reported P&L ineffectiveness and forecast error.

Necessarily, certain issues cannot be covered. The most important issue concerns bifurcating derivatives that are embedded in host contracts, although the main elements are discussed in Section 4, Derivative Definition. Three other major areas not covered are the disclosure requirements, which are listed in ¶44-47 (this and all subsequent ¶ references will refer to FAS 133 Green Book paragraphs); the substantial body of DIG issues involving commodity hedging; and taxes. Regarding the latter, all cash flow and net investment hedges must be tax-effected per FAS 130 and there are numerous FAS 133 book-US tax differences.

2. HISTORICAL BACKGROUND

Prior to FAS 133, US GAAP derivatives literature was inconsistent and inadequate. There was no GAAP for commodity hedging. Derivatives were usually valued at

historic cost, which was often zero. FX options, but not forward contracts, were allowable hedges. Synthetic instrument accounting magically transformed a LIBOR swap of a CP portfolio into long-term fixed rate debt. Derivative losses were classified as assets but were most often entirely ignored.

Issued in June 1998, FAS 133 declared that derivatives are assets and liabilities and should be recorded as such at their fair value on the balance sheet. It abolished synthetic instrument accounting. Instead, all derivative hedges must be documented and proven to a highly effective hedge of the underlying hedged position. If not, then any changes in the fair value of the derivative are to be recorded in current earnings. In addition, while a hedge may be highly effective, it may not fully hedge the underlying, and that difference — hedge ineffectiveness — must be reported currently in earnings.

For the first time, US GAAP is requiring hedging *performance*, rather than hedging *intent*, as the criterion for determining whether to apply deferral accounting for the derivative gain or loss. Two surveys in 2001 and 2002 by the Association for Finance Professionals show that US corporate derivative hedging is now lower than prior to FAS 133. "Macro" or portfolio hedges are now much rarer.

Arguably, the FASB has reduced the speculative "closet" hedging that led to so many well-known derivative debacles in the 1990's. No longer are companies so willing to speculate, knowing that if the hedge goes wrong, they cannot avoid reporting the derivative losses in their financial statements.

To flesh out FAS 133's rigorous but vaguely stated requirements, the DIG was formed in August 1998. Consisting largely of Big 5 derivative experts, the DIG provided guidance to the FASB Staff for resolving some 175 questions on FAS 133. Organized alphanumerically in logical categories (e.g., F7 or G20), these "DIG issues" represent the Staff's (but not the Board's) views on how FAS 133 is to be implemented.

In May 1999, FAS 137 postponed for one year the mandatory adoption date for 133 because too many issues still needed resolution. In June 2000, FAS 138 corrected some obvious deficiencies. With restrictions, cash flow FX hedges could be netted, and cross-currency interest rate swap hedging of foreign debt was permitted.

Interest rate risk was redefined to be a benchmark interest rate, e.g., Treasuries, rather than the all-in rate, including the credit spread. This eliminated a significant source of hedging ineffectiveness.

In May 2002, FASB proposed a new amendment to FAS 133. Highly technical and criticized in its dissent section as inadequate by some Board members, the Board in September 2002 decided not to approve the amendment. It is not clear what further changes to FAS 133 will occur.

What is clear is that the Board continues to view FAS 133 as an important first step towards its long-term objective of having all financial instruments — derivative and nonderivative — measured at fair value (§247). Standing as it does between historical cost accounting and fair value accounting, FAS 133 is a hybrid document that admirably tries, but does not always succeed, to reconcile the differences between two fundamentally different accounting models.

3. FAS 133 FRAMEWORK

Yet, despite two amendments and 175 DIG issues, the original statement established a robust accounting framework that has not been amended or changed, only clarified. FAS 133 defined for the first time what a derivative is, and then using that definition, proscribes that:

- All derivatives must be fair valued on the balance sheet, including those that are embedded in host contracts that are not normally fair valued under US GAAP. In the latter case, the derivative must be bifurcated from the host contract and then fair valued as if it was a stand-alone derivative.
- There are three types of hedging relationships: fair value (FV) hedges, cash flow (CF) hedges, and net investment (NI) hedges for four kinds of allowable risks: entire change in fair value, the change in fair value attributable to FX risks, the change in fair value attributable to changes in the benchmark interest rate, and the change in fair value due to credit worthiness of the instrument being hedged. These hedging relationships must be fully documented at the inception of the hedge and are more fully described in Section 7, Hedge

Documentation.

- All hedging relationships must be “highly effective,” passing a documented Highly Effectiveness Test (HET). If not, then the hedge relationship must be terminated, and the net change in the value of the derivative is immediately and fully recorded in current earnings.
- If highly effective, the change in the fair value of the derivative is allocated, in accordance with the hedge documentation, into three possible components: the “effective portion,” the “ineffective portion,” and “the excluded portion.” Changes in the ineffective and excluded portions are always recognized immediately in earnings, regardless of the type of hedging relationship.
- If the hedge is a fair value hedge, the “effective portion” is also recognized currently in earnings. However, the hedged item is also fair valued on the balance sheet, with the change in fair value also going into earnings, where it will be offset by the change in the effective portion of the derivative.
- If the hedge is a cash flow hedge, then the effective portion is recognized in Other Comprehensive Income (OCI) and then recorded on an after-tax basis in Accumulated Other Comprehensive Income (AOCI), a retained earnings account, in accordance with FAS 130. The AOCI is reclassified into earnings when the underlying hedged item impacts earnings.
- If the hedge is a net investment hedge, the effective portion is also recognized in OCI and then recorded in AOCI, again in accordance with FAS 130. However, the AOCI is reclassified into earnings only when the subsidiary is subsequently sold or liquidated.
- Hedge relationships can be voluntarily or involuntarily terminated. The latter occurs when the hedge relationship fails the highly effectiveness test or when the underlying hedged forecast is no longer probable or the hedged firm commitment is no longer firm.

Anyone trying to understand FAS 133 must have a copy of the 800-page Green Book, which is a clean

statement of FAS 133 as amended as of December 2001. In it, various 133 paragraphs are annotated with references to specific DIG issues, which are also included in the bound volume.

The biggest cause for confusion in FAS 133 is its use of the term “fair value.” At times fair value means fair market value, as in how an economist or bank trader would mark-to-market a derivative or financial instrument, and is always used in this sense for fair valuing a derivative on the balance sheet. However, in the effectiveness testing, fair value is best understood as a technical accounting term whose definition can vary considerably depending upon the actual hedge documentation.

4. DERIVATIVE DEFINITION

Per FAS 133, ¶6, a derivative is a

“... financial instrument or other contract with all three of the following characteristics:

- a. It has (1) one or more underlyings and (2) one or more notional amounts or payment provisions, or both. These terms determine the amount of the settlement or settlements and, in some cases, whether or not a settlement is required.
- b. It requires no initial net investment or an initial net investment that is smaller than would be required for other types of contracts that would be expected to have a similar response to changes in market factors.
- c. Its terms require or permit net settlement. It can be readily settled net by a means outside the contract, or it provides for delivery of an asset that puts the recipient in a position not substantially different from net settlement.”

An underlying is a specified interest rate, security price, commodity price, foreign exchange rate, index of prices or rates, or other variable. A notional amount is some sort of face value. Examples of derivatives include: FX forward contracts, FX options, interest rate caps and collars, interest rate swaps, forward rate agreements, cross-currency interest rate swaps, etc.

However, there are a number of exceptions as to what qualifies as a “FAS 133 derivative.” These are listed in

¶10, and include:

1. “Regular-way” security trades, i.e., normal security trades executed on an exchange.
2. Normal purchase and sales contracts involving the sale or purchase of something other than a financial instrument.
3. Certain insurance contracts.
4. Certain financial guarantee contracts.
5. Certain contracts not traded on an exchange, such as a weather-related derivative.
6. Derivatives that serve as impediments to sales accounting.

There are also some other important exceptions listed in ¶11 involving derivative contracts of the company’s own stock or contingent consideration in a business combination. The ¶10-11 exceptions are supplemented by numerous DIG issues.

An even more complicated area is embedded derivatives, in which there is a derivative meeting the ¶6 definition that is part of a “host contract” containing other contractual flows that do not in their entirety, qualify as a ¶6 derivative. In these situations, per ¶12, the embedded derivative must be bifurcated from the host contract and accounted for as a derivative instrument under FAS 133 if, and only if, all of the following conditions are met:

- The economic characteristics and risk of the embedded derivative instrument are not clearly and closely related to the economic characteristics of the host contract.
- The host contract, including the embedded derivative, is not remeasured at fair value under otherwise applicable generally accepted accounting principles, with changes in fair value reported in earnings as they occur.
- A separate instrument with the same terms as the embedded derivative instrument would, pursuant to paragraphs ¶6-11, be a derivative under FAS 133.

An example of an embedded derivative would be an S&P 500 stock option embedded in a bond. A stock index option is not clearly and closely related to the

normal interest nature of a bond. However, a convertible bond, where the bond is convertible to the stock of the bond issuer, would not be considered an embedded derivative due to the §11 exclusion of derivatives related to the company's own stock.

Overall, the intent of §6-16 and over 30 DIG issues (B1-33) is to apply FAS 133's marking-to-market requirements to stand-alone financial derivatives as well

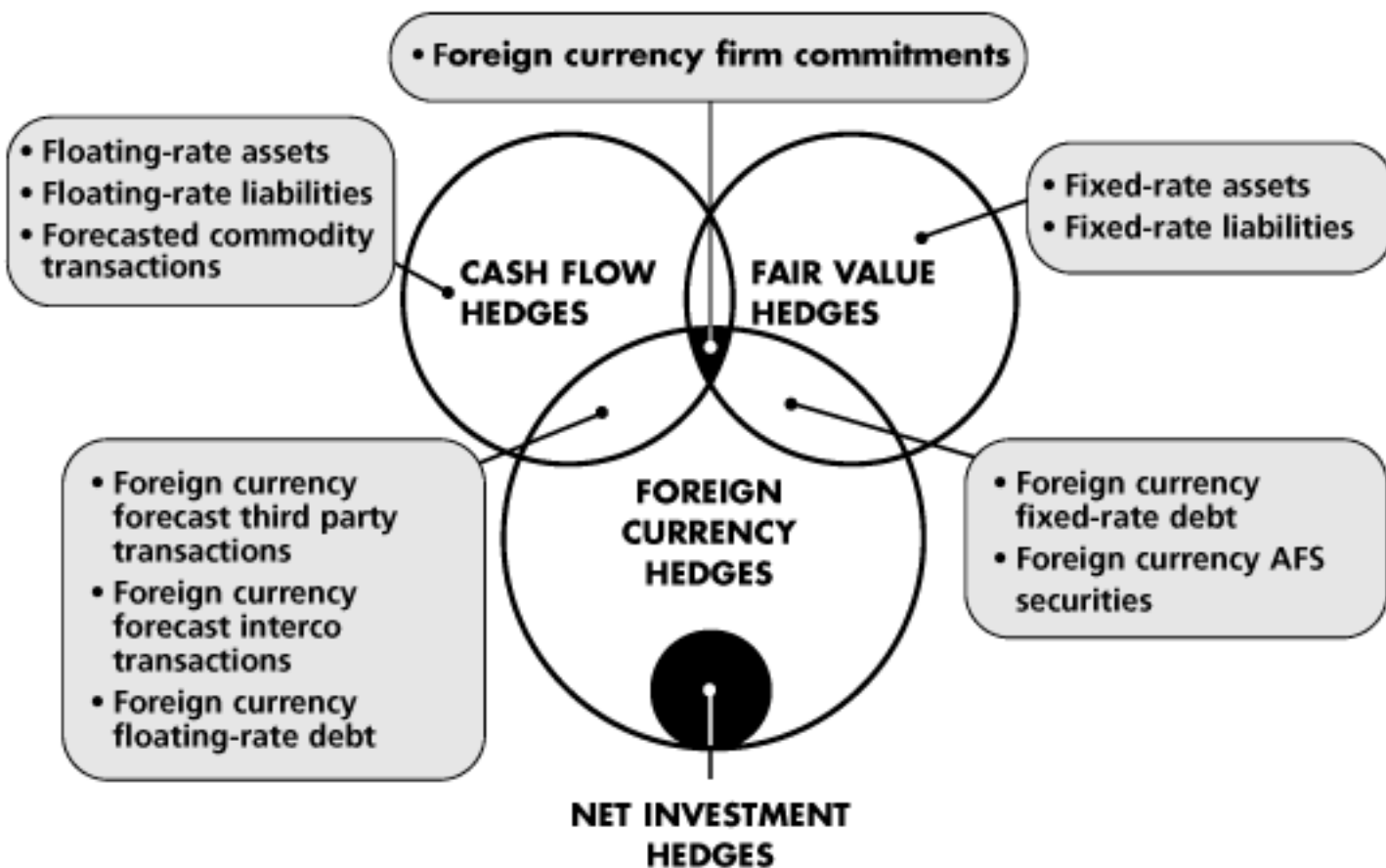
as to derivatives deliberately "hiding" in host contracts that are not clearly and closely related to the host contract. At the same time, the Board wants to exclude bifurcating derivative-like instruments that are not normally considered derivatives and should not be marked-to-market. Nonetheless, embedded derivatives remain an elusive concept that has not been well defined to anyone's satisfaction.

5. THE THREE FAS 133 HEDGE TYPES

A FAS 133 hedge relationship is a documented and identifies an allowable hedged item's financial risk(s) and a qualified hedge instrument. The hedge instrument is normally a derivative, but in certain cases can be an FX

balance sheet exposure. The Venn diagram below shows the three types of FAS 133 hedge relationships, and how they interrelate with each other:

FAS 133 HEDGE TYPES



The schedule below expands on the Venn diagram by summarizing the major differences in the accounting for the three hedge types:

SUMMARY OF FAS 133 ACCOUNTING BY HEDGE TYPE

CATEGORY	FAIR VALUE HEDGES	CASH FLOW HEDGES	NET INVESTMENT HEDGES
Hedged item example	Booked fixed IR exposures or a foreign currency firm commitment	Anticipated or variable FX, interest rate or commodity exposures	Equity position of a foreign affiliate
Foreign exchange example	Forward contract hedge of FC firm commitment	Option hedge of a forecasted intercompany FC sale	Forward contract hedge of Japanese subsidiary's equity
Interest rate example	Fixed debt swapped floating	Floating debt swapped fixed or an interest rate cap	N/A
Foreign currency B/S exposures allowable instruments	Yes	No	Yes
P&L accounting for the hedged instrument	Immediately to P&L	First to OCI, then to AOCI and then to P&L only when the hedged exposure is recorded in P&L	No, only to OCI-CTA and then to AOCI-CTA
B/S accounting for the hedge instrument	Fair market value	Fair market value	Fair market value
P&L accounting for the hedged item	Immediately to P&L	Only when normal GAAP would require booking of hedged item to P&L	Only at sub liquidation
B/S accounting for the hedged item	Fair value	Only when normal GAAP would require booking to the B/S	Normal FAS 52 rules for CTA
Measurement of hedging ineffectiveness	FAS 133 rules	FAS 133 rules	FAS 52's economically effective rules as revised by H6-11
Period for measuring hedging ineffectiveness	Current period	Cumulative from hedge inception	Current period

6. TERMINATION EVENTS

If a hedge relationship fails the retrospective highly effectiveness test, then the hedge is terminated, and the deferred gain or loss on the derivative is recognized currently in earnings and then reported as a separate item in the footnotes in the annual report. For this reason, nearly all corporates will only do hedge accounting if they are very certain that the hedge will indeed be highly effective. Section 8, The Two Highly Effectiveness Tests, discusses the issues involved.

In total, there are five different accounting treatments depending upon how the hedge is terminated and what kind of hedge it is:

A. FV hedge fails the highly effective assessment (§26)

1. Amounts previously recorded as of the last assessment (which was highly effective) remain deferred. If it is known exactly when the FV hedge failed the highly effectiveness test, can record the change in fair value on the hedged item up to the last day (week, month, etc.) it was highly effective.
2. If it is not known when exactly the hedge failed, then there is no marking-to-market of the hedged item for the current period, and the entire current period change in fair value of the hedge instrument goes to P&L (§26).

B. The firm commitment side of an FV hedge is no longer firm or the FV hedged item no longer exists (§26)

1. Any amounts recorded on the balance sheet related to the change in fair value of the *hedged item* are reversed out to P&L (§26).
2. Per §44.a.(2), this is an annual report footnote disclosure item.

C. ACF hedge fails the highly effective assessment (§32.b.)

1. Amounts previously recorded in AOCI as of the last assessment (which was highly effective) remain deferred. If it is known exactly when the CF hedge failed the highly effectiveness test, can record the change in fair value on the hedged

item in AOCI up to the last day (week, month, etc.) it was highly effective.

2. If it is not known when exactly the hedge failed, then there is no adjustment to AOCI, and the entire current period change in fair value of the hedge instrument goes to P&L (§32).

D. The forecast side of a CF hedge is no longer probable (§33)

1. Any amounts recorded in AOCI related to the forecast error amount are immediately reversed out of AOCI and recorded in P&L (§33 and G3).
2. §32 provides a two-month grace period for forecast error. In other words, a forecast that fails to happen by the defined hedged period is given an additional two months to happen before the derivative gain or loss on the forecast error amount must be recognized in earnings.
3. Per §44.b.(4), this is an annual report footnote disclosure item.

E. Voluntary termination by the company (§25.c. for FV hedges and §32.c. for CF hedges)

1. For FV hedges, the amounts previously recorded on the balance sheet related to the hedged item remain fixed on the balance sheet (no reversal).
2. For CF hedges, the amounts previously recorded in AOCI remain in AOCI until the underlying hedged item impacts P&L.
3. For NI hedges, the amounts previously recorded in AOCI-CTA remain there until all CTA amounts are reversed (e.g., at unit liquidation).
4. There's no explicit FAS 133 requirement to document voluntary termination. Market practice is to append a one-page document to the existing hedge documentation stating that the hedge was voluntarily terminated on a specific day, and providing the details of the mark-to-market on the derivative on that day and the resulting termination accounting.

Regarding voluntary terminations, the ability

to voluntarily take hedges on and off at will without impacting prior deferral amounts means that all kinds of dynamic hedging strategies are implicitly allowed. However, since all prior deferred amounts remained deferred, FAS 133 prohibits entities from terminating their profitable hedges (i.e., cherry picking) so that selective hedge profits could be reported into current earnings.

In any type of termination, if any derivatives from the terminated hedges are still outstanding, then they should continue to be fully marked-to-market on the balance sheet, with any subsequent change in fair value recorded in earnings.

7. HEDGE DOCUMENTATION

FAS 133 requires that at the time an entity designates a hedging relationship, it must document the method it will use to assess the hedge's effectiveness in achieving offsetting changes in fair value or offsetting cash flows attributable to the risk being hedged. The hedge documentation can be thought of as a mathematical algorithm for calculating numbers that are recorded in specific income statement, comprehensive income, and balance sheet accounts. The algorithm is to be so precise that anyone reading the documentation could apply it and arrive at the same numbers.

The appropriateness of a given method for assessing hedge effectiveness depends upon the nature of the risk being hedged and the type of hedge instrument being used. An entity should use similar effectiveness methods for similar hedges (§62). Thus, one could not use the time value-intrinsic value effectiveness method per §63.a. for certain European option hedges and also use G20's assumption of perfect option effectiveness for other European option hedges.

Unlike the §20 and §28 requirements for fair value and cash flow hedge documentation, respectively, there's no similar paragraph for net investment hedge documentation. FAS 133's net investment hedging follows closely FAS 52's NI hedging requirements, which do not have any specific documentation requirements. However, DIG

Issues H6-11 specifically deal with net investment hedging, disallowing previously acceptable FAS 52 NI hedges as well as requiring effectiveness testing for cross-currency interest rate swap net investment hedges. As a result, market practice is to document NI hedges as thoroughly as what FAS 133 requires for FV and CF hedges.

Summarizing §20 and §28 as well as two fundamental DIG Issues, E7 and E8, the following items must be specified in the hedge documentation at the inception of the hedge:

A. Risk management objective and strategy for undertaking the hedge transaction (§20.a. and §28.a.)

1. Boilerplate text taken from the company's risk management policy, which must exist.

B. Description of the hedged item (§20.a. and §28.a.)

1. If it is an unrecognized firm commitment or a forecasted transaction, one may want to have some sort of company internal reference number to allow easy tracking of what happens to the commitment or forecast.
2. For effectiveness purposes, the hedge item's maturity and financial characteristics must be known so that it can be fair valued for effectiveness measurement purposes.

C. The hedged item's hedged risks (§20.a. and §28.a.)

1. Allowable risks are overall changes in fair value or in cash flow; or one or more of these allowable component risks: benchmark interest rate risk, FX risk, and the credit risk of the obligor.
2. If the benchmark interest rate, then must indicate whether the benchmark interest rate is the Treasury rate or the LIBOR rate for US\$ instruments or the appropriate benchmark, per market practices, for non-dollar instruments.
3. If it is FX or commodity risk, one must choose whether the hedged item's FX risk being hedged is the risk of changes in (a) spot-to-spot

movements (§165-172), (b) forward rate-to-forward rate movement (§121-126), (c) the entire change in the derivative's fair value (i.e., present value using forward rates, §140-143), or (d) in cash flow hedges, the variability in expected cash flows beyond (or within) a specified level (or levels) on an option pricing model basis (G20).

4. For FV hedges of firm commitment, §20.a.(1) requires a documented reasonable method for recognizing in earnings the asset or liability representing the gain or loss on the hedged firm commitment. This could be spot-to-spot, forward-rate-to-forward-rate or fair market value.

D. Description of the hedge instrument (§20.a. and §28.a.)

1. If it is a balance sheet exposure, then it will be remeasured only on a spot-to-spot basis. Balance sheet exposures can be allowable hedge instruments only for foreign currency firm commitments in FV hedge relationships and in net investment hedges.
2. If a derivative, then the documentation should state how it will be fair valued, i.e., marked-to-market, whether via a pricing model or by market quotes.

E. Amounts, if any, that are excluded from the assessment of hedge effectiveness (§20.a.(1) and §28.a.(1))

Per §63, three exclusions are possible — but not mandated — under certain circumstances. In each circumstance, any changes in the excluded component would be included currently in earnings, together with any ineffectiveness that results under the defined method of assessing ineffectiveness:

1. If the effectiveness of a hedge with an option contract is assessed based on changes in the option's intrinsic value (IV), the change in the time value (TV) of the contract would be excluded from the assessment of hedge effectiveness. $TV = \text{option fair market value (FMV) less IV}$ (§63.a.). IV can be calculated in one of two ways: the spot rate less the strike rate (§162) or the forward rate less the strike rate (E19). However,

per §162, IV cannot be negative. Per E19, additional aspects of an option's time value can also be excluded: theta, vega, and rho. However, these "Greek" exclusions are rarely used in practice because of G20.

2. If the effectiveness of a hedge with an option contract is assessed based on changes in the option's minimum value, that is, its intrinsic value plus the effect of discounting, the change in the volatility value of the contract would be excluded from the assessment of hedge effectiveness. $\text{Volatility Value} = \text{FMV of the option less minimum value}$, which is the present value of IV (§63.b.). Again, IV can be calculated in the two ways noted above. This definition of the excluded amount is very rarely seen in practice.
3. If the effectiveness of a hedge with a forward or futures contract is assessed based on changes in fair value attributable to changes in spot prices, the change in the fair value of the contract related to the changes in the difference between the spot price and the forward or futures price would be excluded from the assessment of hedge effectiveness. This is called forward contract TV = contract forward rate less the spot rate (§63.c.).

F. Prospective assessment methodology (§20.a.(1) and §28.a.(1))

1. As explained in E7, upon designation of a hedging relationship (as well as on an ongoing basis), the entity must be able to justify an expectation that the relationship will be highly effective over future periods in achieving offsetting changes in fair value or cash flows.
2. That expectation, which is forward-looking, can be based upon dollar-offset (or simulations thereof) as well as regression or other statistical analysis of past changes in fair values or cash flows as well as on other relevant information.
3. Other relevant information could be that the critical terms of the hedged item and the hedge instrument are the same (G9).

4. Per F5, the period of the expectation that the hedge will be highly effective can be less than the maturity of the hedged item.

G. Retrospective Assessment Methodology (§20.a.(1) and §28.a.(1))

1. At least quarterly, the hedging entity must determine whether the hedging relationship has been highly effective in having achieved offsetting changes in fair value or cash flows through the date of the periodic assessment. Per E7, that assessment can be based upon the dollar-offset method or regression or other statistical analysis of past changes in fair value or cash flows.
2. Per §71, all foreign currency hedges whether fair value, cash flow or net investment, can be done on an after-tax basis (i.e., “grossing-up” the derivative notional so that after-taxes of both the derivative and hedge item offset exactly). This would need to be documented here as well as in the prospective assessment documentation.

H. Retrospective Assessment Testing Frequency (§20.b. and §28.b.)

1. Determines how frequently the retrospective assessment test and the calculation of hedge ineffectiveness will be tested and calculated.
2. Per §20.b. and §28.b., retrospective assessment is required at least quarterly. User can choose daily, weekly, monthly or quarterly.

I. Period used for the Retrospective Assessment (E7 and E8)

This is the period or time frame used for calculating the change in fair value for the dollar-offset method or over which the statistical analysis will be performed.

1. Allowable options, per E8, are period-by-period or cumulative. If the former, period cannot exceed three months (i.e., could be one day, one week, or one month).
2. If the latter and the dollar-offset method is used, the period starts from the inception of the designation of the hedge.
3. If the latter and statistical analysis is used, then:

- a. Per E7, if an entity elects at the inception of a hedging relationship to utilize the same regression analysis approach for both prospective considerations and retrospective evaluations of assessing effectiveness, then during the term of that hedging relationship those regression analysis calculations should generally incorporate the same number of data points.
- b. If statistical analysis was not used for prospective assessment, then the cumulative period is from the inception of the designation of the hedge.

The above documentation uniquely determines which of 64 theoretically possible calculations are used for calculating the “change in fair value of the hedged item’s hedged risk(s)” and the “change in the fair value of the hedge instruments,” where $64 = 4 \times 4 \times 2 \times 2$:

- 4 different ways to calculate the change in fair value of the hedge item’s hedged risk(s): fair market value, spot-to-spot, forward rate-to-forward rate, and using an option pricing model (the latter per G20 for cash flow hedges only).
- 4 different ways to calculate the change in fair value of the hedge instrument: fair market value with no excluded amounts or fair market value less any of the three allowable excludable amounts, as defined in Subsection 7.E.
- 2 different ways to calculate intrinsic value, as noted in E’s commentary
- 2 different ways for taxes, pre- or post- tax per §71, which is only applicable for FX hedges.

These definitions are then used consistently in that hedged relationship’s calculations of the prospective highly effectiveness test (HET), the retrospective HET, and the measurement of ineffectiveness for P&L and footnote reporting purposes.

8. THE TWO HIGHLY EFFECTIVENESS TESTS

There are two kinds of HET methodologies — the dollar-offset method and statistical analysis — which can be used for prospective and retrospective HET’s.

However, one does not have to use the same methodology prospectively and retrospectively; there's no requirement for consistency (E7).

The dollar-offset method is simply the change in the fair value of the hedge instrument as specified in the documentation by the change in the fair value of the hedged item's hedged risk, again as specified in the documentation. This ratio, typically calculated as a percentage, should be within a range of 80-125% or 80-120%. Otherwise, the hedge is not highly effective and should be terminated. In practice, many use the 80-125% range, which was articulated by the SEC at its 1995 Annual Accounting Conference. The FASB clearly prefers 80-120%.

A key parameter in calculating the dollar-offset is whether the changes are calculated over the current assessment period or cumulatively since inception. Both are acceptable per E7. The cumulative period is recommended since the dollar-offset ratio over a longer period should be more stable than the ratio over a shorter period and thus less likely to fall outside of the range. There's a risk, particularly in complex interest rate hedging, that small changes in interest rates will cause small changes in the dollar-offset's numerator and denominator that will result in large numbers wildly outside the 80-125% range, even though the small changes are immaterial by themselves.

Regarding statistical analysis, as E7 notes, "The application of a regression or other statistical analysis approach to assessing effectiveness is complex. Those methodologies require appropriate interpretation and understanding of statistical inferences." Regression analysis is the most common statistical method. Briefly, ¶75 allows regressing on price levels, rather than changes in prices, since one could have highly correlated prices but not highly correlated price changes.

If a regression analysis is done, market practice agrees that the R^2 must be 80% or better to be considered highly effective. One important factor to consider is the time period over which the regression analysis should be conducted. Clearly, one would want a period sufficiently long to "dampen" any current period volatility that could cause an $R^2 < 80\%$.

An alternative to regression analysis is a value-at-risk like approach that is known as either the "volatility

reduction method" or the "variance reduction method" or "VRM." It calculates the reduction in the volatility after the hedge compared to the volatility of the hedged item alone using this formula:

$$1 - \left[\frac{\text{standard deviation of the hedged item and the hedge instrument}}{\text{standard deviation of the unhedged hedged item}} \right]$$

As with regression analysis, this statistic is calculated over an historic time period using historic rates, consistent with how both changes are defined in the hedge documentation, which is generally going to be on a full market value basis. If this was greater than some agreed-upon parameter, say 80% (in other words, the volatility of the position has been reduced by the hedge by 80%), then the hedge relationship would pass this HET. Please see the excellent articles in the References on statistical analysis for more detailed explanations of what is involved, including the statistical complexities, in using both regression analysis and VRM.

As a general rule, it is better to use any kind of statistical test, rather than the dollar-offset method, for hedging relationships in which there is basis risk or relatively large imperfect matching of the critical terms or, especially, when there is portfolio hedging. The dollar-offset test is inflexible, making no adjustment for when there is a period of financial market distress, such as the 1998 Asian/Russian Ruble crisis. During volatile financial markets, a statistical approach may allow a hedge to be considered highly effective, while the dollar-offset test might well cause the hedge to be considered ineffective and then terminated. An $R^2 > 80\%$ requirement is not a restrictive test for most reasonable hedges.

9. MEASURING INEFFECTIVENESS

Assuming that the retrospective assessment methodology has shown the hedge to be highly effective, there may be some hedge ineffectiveness that needs to be recorded in current earnings. The actual calculation of any hedge ineffectiveness is based on the extent to which *an exact offset* is not achieved as specified in ¶22 of Statement 133 (for fair value hedges) or ¶30 (for cash flow hedges) between the documented change in the fair value of the hedged item and the documented change in the fair value of the hedge instrument.

For fair value hedges, this is a current period test, i.e., FV hedging ineffectiveness is the difference between the current period changes in fair value of both sides of the hedging relationship. For cash flow hedges, it is “the lesser of the two cumulatives test” which is based upon cumulative changes in fair value since hedge inception (§30.b., see §141 for an example). It is a complex test, and the text which follows assumes a full understanding of the §141 example. The test is designed to record into cumulative P&L only the difference between the cumulative change in value of the derivative less the cumulative change in the value of the hedged item if, and only if, the absolute value of the cumulative change in the derivative is greater than the absolute value of the cumulative change in the hedged item.

The Board’s intent with this test is to ensure that if change in the derivative is greater than the change in the underlying, the difference will be recorded in earnings. However, in the case where the change in the underlying is greater than the change in the derivative, the Board wanted this difference *not* to be booked in the financial statements. The Board’s rationale was that since cash flow hedges always have a forecast hedged position that would not be ordinarily booked currently in the financial statements, any forecast “excess” over the change in the fair value of the derivative should not be booked either. Section 12, Minimizing Ineffectiveness, discusses the implications of this asymmetric test.

As discussed earlier, the actual calculations of the changes in fair value of the hedge item’s hedged risk(s) and of the hedge instrument is one of 64 possible ways defined in the hedge documentation and it is these definitions of the changes in fair value that are used to calculate the actual amount of ineffectiveness. Thus, we can then allocate the change in the true fair market value of the hedge instrument into three possible components:

1. The excluded amount, if any, per the hedge documentation, which goes to P&L.
2. The ineffective amount is calculated using the ineffectiveness measurement tests described above depending upon whether it is a fair value or cash flow hedge. See H6-11 for ineffectiveness tests related to net investment hedges.
3. The effective amount is the residual, equal to the change in the net present value of the hedge

instrument, less any current period excluded amounts less any current period ineffectiveness.

For cash flow hedges, the effective amount goes to OCI and then AOCI. For fair value hedges, the effective amount goes to P&L. Thus, for FV hedges, it may seem that the calculation of the three components is not strictly necessary because everything goes to P&L. However, year-end footnote disclosure for FV hedges (as well as for CF hedges) requires reporting, by type of hedge, of the year’s cumulative excluded amounts and cumulative ineffective amounts (§45).

10. THREE HET EXCEPTIONS

These are the basic rules of the game, and, like any game, there’s no point in arguing about the rules; it’s how you play with the rules. Of course, it wouldn’t be FAS 133 if there weren’t some exceptions. There are three exceptions to the requirement for using either the dollar-offset or statistical analysis for determining whether a hedge is highly effective:

1. When the critical terms of the hedge instrument and the hedged position are the same.
2. The shortcut method for interest rate swaps.
3. The hypothetical derivative method.

DIG Issue G9 allows the “assumption” that a cash flow hedge is fully effective if the terms of the derivative hedge are such that the changes in the derivative’s fair value are expected to *completely offset* the expected changes in the cash flows of the hedged risk on an ongoing basis. At a minimum, the following critical terms must be the same:

- The notional amount of the derivative is equal to the notional amount of the hedged position.
- The maturity of the derivative equals the maturity of the hedged position.
- The underlying index of the derivative matches how the changes in the fair value of the hedged position are calculated.
- The fair value of the derivative is zero at inception.

If so, then G9 requires that the equivalence of the critical terms is explicitly stated in the documentation and that there is an ongoing assessment both

prospectively and retrospectively that the critical terms have remained the same. If the terms have changed, then either of the two highly effectiveness tests must be applied as well as the calculation of any hedge ineffectiveness. Since many entities do “perfect” hedging, G9 is welcome relief from the burdensome detailed record keeping that FAS 133 requires.

The shortcut method for interest rates swaps is described in ¶68-69. They apply to both fair value interest rate swap hedges of fixed rate debt and cash flow interest rate swap hedges of floating rate debt. Essentially, if — and only if — the interest rate swap matches the underlying debt perfectly in all respects (including any call provisions), then the swap can be assumed to be perfectly effective, and there is no need to do any highly effectiveness testing nor calculate any hedge ineffectiveness.

For FV hedges, the swap is fully marked-to-market on the balance sheet, with an offset to earnings. At the same time, the debt is “fair valued” (i.e., not marked-to-market) by an amount exactly equal to the mark-to-market on the swap, with the change in the mark-to-market going to earnings. Since the two amounts going to earnings are identical, there’s no earnings impact. For CF hedges, the swap is also fully marked-to-market on the balance sheet with the offset going to AOCI. For both kinds of hedges, reported interest expense is equal to the debt interest plus the net interest flows on the swap.

Shortcut treatment is a most desirable method because it simplifies the FAS 133 accounting and provides essentially the same answers as synthetic instrument accounting. For more information on how the shortcut treatment can be applied and not applied in a number of circumstances, see DIG Issues E4, E6, E10, E15, E16, and F2. E15 deals with the inability to apply shortcut treatment of debt acquired in a business combination. F2 deals with the related issue of the proper accounting for interest rate swaps that hedge debt for a shorter term than the debt itself.

The last exception, the hypothetical derivative method, is a powerful FAS 133 effectiveness technique that was first explicitly introduced in DIG Issue G7. It was needed for those situations in which the interest rate swap does not perfectly match the terms of the

underlying debt. Without the shortcut method, any interest rate swap hedge, even a perfect swap, would fail either highly effectiveness test. The change in the fair value of the derivative would not sufficiently offset the change in the fair value of the underlying debt because fair valuing the debt would involve fair valuing the principal repayment. The derivative, of course, has no principal repayment to fair value.

Thus, G7 developed a new method in which the hedged debt for effectiveness testing purposes could be treated as if it was a hypothetical derivative that mirrored all of the terms of the debt, but without the principal repayment cash flow. This eliminates the artificial ineffectiveness caused by the principal flow. The changes in the mark-to-market of both the hypothetical derivative and the real derivative are then used with the dollar-offset or statistical analysis to test for highly effectiveness. If highly effective, then any ineffectiveness is the difference between the two mark-to-markets.

The hypothetical derivative method is an elegant solution to the problem of developing reasonable effectiveness tests. By analogy, it can be used in cross-currency interest rate swap (CCIRS) hedging, which, while permitted by FAS 138, cannot be done using the shortcut method, which only applies to pure interest rate swaps. H8 requires that ineffectiveness be calculated when a CCIRS is used as a net investment hedge. H8 uses a forward contract as the hypothetical derivative for the underlying net investment position.

The hypothetical derivative method is actually not a new concept. It was implicit in the original FAS 133 statement regarding the hedging of forecast foreign exchange exposures. One of the allowable definitions for the change in the fair value of the foreign exchange exposure is the change in its fair market value, which can be only calculated assuming a hypothetical forward contract with the same maturity of the exposure with a forward rate that gives the hypothetical forward an initial zero cost. In addition, as discussed in Section 11, Option Hedging, per G20, an FX exposure can be described for effectiveness purposes as the change in value of a hypothetical European option that matches the terms of the forecast exposure.

Please note that, as already mentioned regarding the critical terms, the hedge documentation must

specifically mention shortcut treatment or refer to G20 to be able to use these exceptions in the hedge's effectiveness testing.

11. OPTION HEDGING

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. 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).

Originally issued in April 2001 and finalized that August, DIG Issue G20, Assessing and Measuring the Effectiveness of a Purchased Option Used in a Cash Flow Hedge, eliminates FAS 133's original 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.

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.

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.

This will make more kinds of non-vanilla options acceptable 133 hedges because the effectiveness tests will be comparing the pricing of the actual option against the hypothetical option, and they should be more closely related.

12. MINIMIZING INEFFECTIVENESS

The best way to minimize hedge ineffectiveness is to match the hedge instrument perfectly with the hedge exposure and then declare that since the critical terms are the same, we can assume that the hedge is 100%

effective, as discussed earlier in Section 10, Three HET Exceptions. Obviously, this is not always practical.

If it is a cash flow hedge, another approach is to take advantage of the asymmetric lesser of the two cumulatives ineffectiveness test. As discussed in Section 9, Measuring Ineffectiveness, if the cumulative change in the fair value of the hedging derivative is less than the cumulative change in the fair value of the hedged position, then no ineffectiveness is recognized.

There are two ways this can be generally achieved. Either document the derivative as hedging a notional exposure greater than the notional value of the derivative or have the derivative's maturity be less than the documented maturity of the exposure. By having the documented exposure either larger or later than the derivative, the change in the fair value of the exposure will be generally greater than the change in the fair value of the derivative.

Of course, there are some obvious risks with these approaches. A smaller than necessary derivative may lead to underhedging of the true economic risk. Or, if the notional amount of the exposure is artificially inflated, forecast error risk is increased. Having the derivative mature before the exposure's expected maturity runs the price risk of having to subsequently rollover the derivative at some unknown rate to fully cover the entire forecast exposure period. In all cases, the highly effectiveness tests must be passed first before the hedge ineffectiveness is calculated, so if the differences in notional amount or maturity are too large, the HET may fail, causing the hedge to terminate.

Monte Carlo simulations are another way to manage ineffectiveness. For example, one could run 2000 or so Monte Carlo simulations on the ineffectiveness statistic, which in complicated hedging situations is usually the difference between the change in the fair market value of both sides, to develop a probability distribution of the ineffectiveness. Then in a VAR-like approach, the 5% tail could be examined to determine the maximum amount of ineffectiveness with 95% confidence to see if this amount of ineffectiveness is acceptable.

In complex IR portfolio hedging, simulations could be used to evaluate the ineffectiveness risk of different hedge ratios, i.e., using different derivative notionals to determine which one minimizes ineffectiveness and

economically hedges the exposure. A similar process could be done with exotic option hedging against the hypothetical option per G20. The hypothetical option could be documented to have any strike rate, and simulations could be run to determine which hypothetical strike best minimizes ineffectiveness with the real option.

Please see the chart at the end of this monograph, "Summary of Key FAS 133 Measurement Processes," that summarizes the measurement methods discussed in Sections 7-11.

13. MINIMIZING FORECAST ERROR RISK

When a hedged forecast is no longer considered probable to occur, the net G/(L) in accumulated OCI is immediately reclassified into earnings on the forecast error amount. ¶33 (amended) allows a two-month grace period after the exposure maturity in the documentation. This is not necessarily a great boon because often companies are hedging consecutive months, and when they do so, they often state in the documentation that the hedged forecast represents the first x dollars (or yen or whatever) occurring in the month. Thus, if there is a forecast shortfall in June, to use it up in July would require the July actual to more than cover the July hedge's forecast, and then any actual over the July hedge exposure could be applied against the June shortfall.

Per ¶494, a pattern of forecasted transactions not occurring would call into question the entity's ability to accurately predict transactions and thus the propriety of using cash flow hedge accounting. In other words, too many forecast errors and cash flow hedge accounting could be taken away from you.

A long hedge period for the forecast to error is one of the best ways to minimize forecast error. So rather than hedging forecasts that occur in a given month, it is better to hedge quarterly or semi-annual forecasts. Wide hedge periods are quite possible; ¶460 uses a six-month hedge period and G16 uses a five-year hedge period. However, both of these citations are examples of a single forecasted event. Most hedging of forecasts is hedging a portfolio of forecast transactions, such as forecast foreign currency sales or purchases. FAS 133 allows cash flow hedging of a portfolio and requires that the hedged risk of the

portfolio components share the same risk exposure. However, unlike fair value portfolio hedging, in which sharing the same risk exposure is explicitly defined (§21.a.(1)), there is no such definition for cash flow portfolios. In practice, companies have been able to hedge quarterly forecasts, especially if they are doing their hedge assessments for effectiveness on a quarterly basis and their internal forecasting is done on a quarterly basis.

Another way to minimize forecast error risk is to aggregate like forecasts together for hedge documentation purposes. A company with export sales in euros to France, Germany, Belgium, etc., should not have individual hedge documentations for export sales to each country. Instead, aggregate all of the euro export sales together, and write the hedge documentation on that amount. Note that §40.a. discusses how FX exposures of a group of operating units with the same functional currency can be aggregated and hedged.

Another way to reduce forecast error risk is to lower the hedge ratio. For example, say a company forecasts £100 of sales to the UK for a given period. Many companies will only hedge a portion of the £100, say 80%. In the hedge documentation, they would say that they were hedging the first £80 of sales for the given period. If they have significant concerns about the validity of the forecast, they might hedge only £60 and minimize the risk for FAS 133 purposes of forecast error. However, by doing so, this risks underhedging the actual sales, a true economic risk. In these circumstances, a useful approach is to hedge in layers or tiers. In this approach, the first hedge is for a small amount, say 20-40%. Then as the forecast gets closer and closer and there is more confidence in the forecast, the hedge increases in stages, say 20% at a time, until the forecast is perhaps 90-100% hedged with one month out. This progressive hedging would simply require more hedge documentation for each new hedge.

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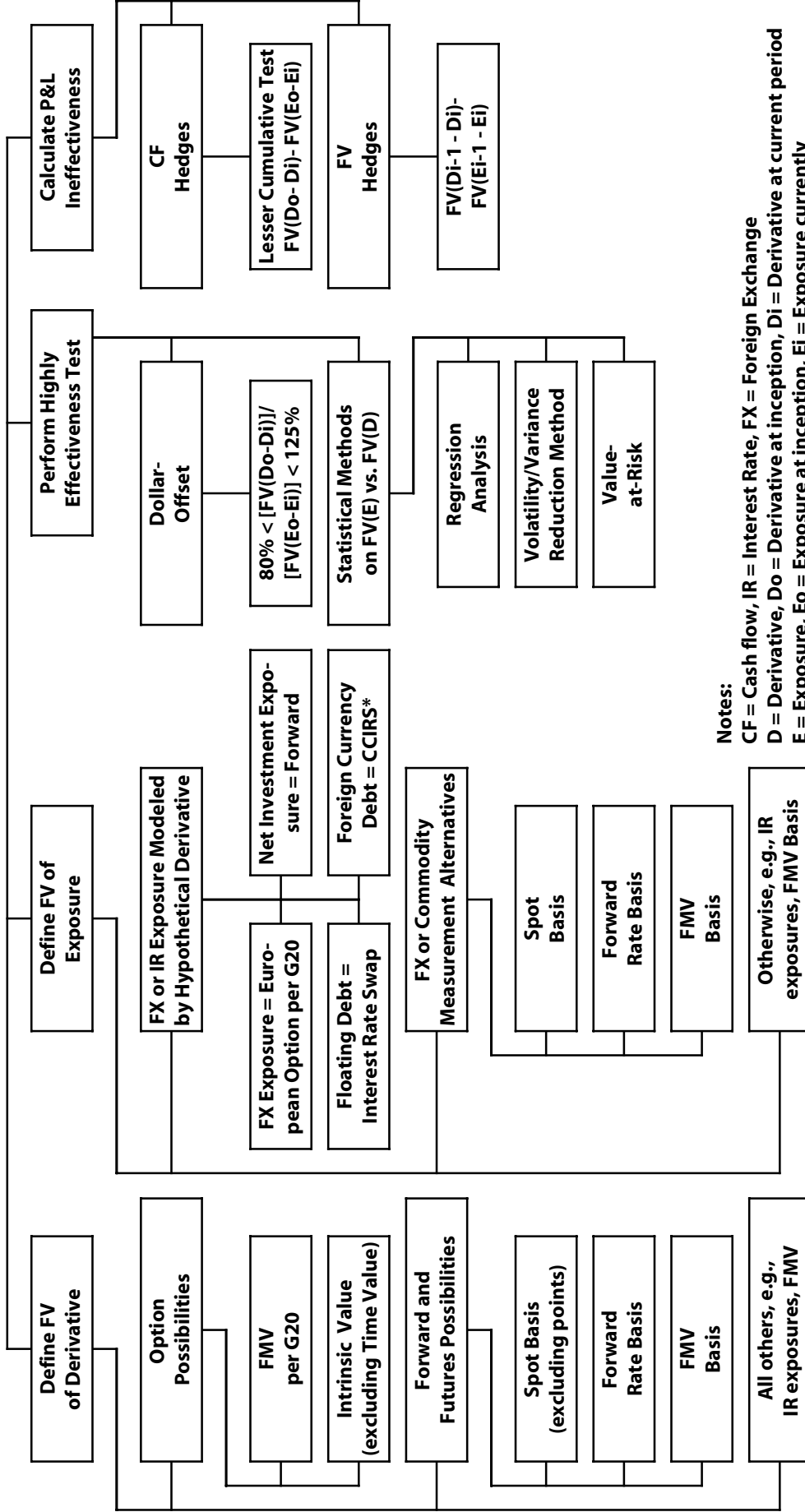
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Summary of Key FAS 133 Measurement Processes



Notes:

CF = Cash flow, IR = Interest Rate, FX = Foreign Exchange
 D = Derivative, Do = Derivative at inception, Di = Derivative at current period
 E = Exposure, Eo = Exposure at inception, Ei = Exposure currently
 FV = FAS 133 Fair Value (which is not always = fair market value)
 FV(Do-Di) = FV of derivative at inception less FV of derivative at current period
 FV(Ei-1 - Ei) = FV of exposure at prior period less FV of exposure at current period
 FMV = Fair market value per market quotation or pricing model
 Time value can be calculated in two different ways per FAS 133, para. 63 and E19
 *FC debt can be modeled as a hypothetical CCIRS for CF hedges only



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