Divergent FAS-133 and IAS 39 Interest Rate Risk Hedge Effectiveness: Problem and Remedies

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Generally, it is presumed that an interest rate swap hedge of fixed income assets and liabilities will be 100% effective. Specifically, SFAS-133.68 actualizes this effectiveness through its short-cut method (SCM) interest rate risk hedge specification. We show that this presumption is false. This negative finding leads to a severe IAS-39 implementation problem because IAS-39 explicitly precludes the SCM. Furthermore, this problem has major implications for bank (and insurance) capital requirements. We specify a series of remedies for this problem. We believe that the best remedy falls in the fine print of IAS-39.F.5.5 guidance. In this guidance, a "theoretical swap" hedge effectiveness method, (B), effectively, provides FAS-133 SCM treatment for analogous IAS-39 interest rate risk hedges.

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Abstract:

Generally, it is presumed that an interest rate swap hedge of fixed income assets and liabilities will be 100% effective. Specifically, SFAS-133.68 actualizes this effectiveness through its short-cut method (SCM) interest rate risk hedge specification. We show that this presumption is false. This negative finding leads to a severe IAS-39 implementation problem because IAS-39 explicitly precludes the SCM. Furthermore, this problem has major implications for bank (and insurance) capital requirements. We specify a series of remedies for this problem. We believe that the best remedy falls in the fine print of IAS-39.F.5.5 guidance. In this guidance, a "theoretical swap" hedge effectiveness method, (B), effectively, provides FAS-133 SCM treatment for analogous IAS-39 interest rate risk hedges.

Current definitions of prospectively effective hedges under FAS-133/138 and IAS 39 remain quite loose.[1] In contrast, the actual and retrospective tests for effectiveness are both direct and tight.

Some important implications of this difference have not been widely recognized. A possible reason for this prospective failure is the FAS-133 short-cut method (SCM) exception for certain interest rate hedges (SFAS-133.68). The IASB does not provide an SCM exception for interest rate risk hedges. We show that many interest rate risk hedges that qualify for SCM under FAS-133 (and are deemed 100% effective hedges) will fail the retrospective effectiveness test of IAS-39.[2] Clearly, this situation is inconsistent with FASB and IASB convergence objectives.

Since interest rate risk is, by far, the most hedged risk, this inconsistency has been part of the motivation for EU Accounting Regulatory Committee (ARC) and other Accounting regulatory bodies to postpone adoption of certain portions of the IAS 32 and IAS 39 standards.

[1] Bodurtha (2000) discusses prospective hedge effectiveness tests.

[2] AG108 will be, too often, incorrect.

Basel II capital standards are also likely to be impacted because bank capital requirements are derived from reported income and balance sheet statements.

To partially address the Standards' inconsistency and IAS-39 interest rate risk ineffectiveness problems, we outline three classes of remedies: ad-hoc, Implementation Guidance-based and markets-based. Among these alternatives, the Implementation Guidance-based remedy leads to the most congruence between IAS-39 and FAS-133. The ad-hoc remedies are not fully effective or must also be combined with market-based remedies.

1) Inconsistency of Prospective and Retrospective Interest Rate Risk Hedge Effectiveness Tests.

FAS-133 finesses the fundamental ineffectiveness of swap-based hedges of bond, loan, deposit and other fixed income asset and liability interest rate risk. The finesse is a direct waiver for swap interest rate risk hedges that have terms that are sufficiently close to the hedged item contract terms.

The simplest example both highlights the hedge ineffectiveness problem and provides a counter-intuitive result – hedge ineffectiveness is large and constant.

Consider a two coupon-paying bond:

$$B = \frac{C}{1+R_1} + \frac{C+100}{(1+R_2)^2} = \frac{C}{1+y} + \frac{C+100}{(1+y)^2}$$

- B bond price in nominal terms of a bond that matures at time T, the current (spot) price of the bond.
- C Coupon on a bond maturing at time T. (At par issue, C = y 100.)
- R_T interest rate in nominal for funds invested or lent to time T. The rate is stated on a periodic bond-equivalent zero coupon basis.
- y yield in nominal terms on a T maturity bond. Yields are quoted on a periodic bond-equivalent coupon basis

Define the forward rate from time 1 to time 2:

$$ {}_1R_2 = \frac{(1+R_2)^2}{1+R_1} - 1 $$

The variable rate note (VRN), V, corresponding to the coupon bond is

$$ V = \frac{F_1\ 100}{1+R_1} + \frac{(1+{}_1R_2)100}{(1+R_2)^2} = \frac{(1+F_1)100}{1+R_1} $$

F_1 interest rate for funds invested or lent to time 1. The rate is stated on a periodic bond-equivalent zero coupon basis. With VRN rates paid in arrears, this rate will equal the first period discount rate only at inception, $R_1 = F_1$ (and on any reset date).

A receive fix-pay float swap, S, is equivalent to owning a coupon bond and owing a VRN. This swap is long the bond and short the VRN.

$$ S = B - V = \frac{C - F_1\ 100}{1+R_1} + \frac{C - {}_1R_2\ 100}{(1+R_2)^2} = \frac{C}{1+R_1} + \frac{C+100}{(1+R_2)^2} - \frac{(1+F_1)100}{1+R_1} $$

To hedge a purchased fixed rate asset that is funded at floating rates, a pay fix-receive float swap will be used. For a fair value hedge, the definition of this swap-based interest rate risk hedge effectiveness, ε–1, follows:

$$ \text{Effectiveness} = \frac{-\Delta S}{\Delta B} = \frac{\Delta V - \Delta B}{\Delta B} = \frac{\Delta V}{\Delta B} - 1 = \varepsilon - 1 $$

As a first step in analyzing effectiveness, we determine the impact of an instantaneous change in the short-term rate, R_1.

$$ \text{Effectiveness} = \varepsilon - 1 = \frac{(1+F_1)100}{C} - 1,\ \Delta V = -\frac{(1+F_1)100}{(1+R_1)^2},\ \Delta B = -\frac{C}{(1+R_1)^2} $$

If the yield curve is flat, then the interest earned on the first leg of the VRN, F_1 x 100, will equal the bond coupon, C. For any change in the short-term rate and no change in the longer-term rate, the effectiveness ratio is the inverse par coupon yield: 100/C.[3]

[3] JP Morgan (2003) documents ineffectiveness of swap hedges, but assigns these differences to differing coupon accrual on the bond and swap. They state that ineffectiveness is largely resolved by removing the accrual and

For an instantaneous change in the shortest zero coupon discount rate, the effectiveness test result is constant and ineffective. Furthermore for most world economies and relatively short-lived hedged items, the effectiveness test is guaranteed to fail. Because the coupon yield is usually low, it's inverse, the effectiveness test, is relatively large. For a 20% coupon yield example, a drop in the short rate results in a 500% effectiveness ratio. For a two-year coupon bond paying roughly 3% annually, a drop in the short-end of the zero coupon rate curve results in a 3,333% effectiveness test result.

We emphasize that this result is not empty. All coupon bonds must transit the case of having only two coupons remaining. In many market situations, short rates drop or rise while longer-term rates remain relatively constant. To show this phenomenon in the standard accounting context, we treat parallel rate curve shifts below.

Our negative result applies equally to monthly, quarterly, semi-annual or any other non-continuous coupon paying bond. If the floating rate of the swap hedge is not reset on the hedge effectiveness evaluation date, then movements in short-term rates alone will cause hedge ineffectiveness.

Finally, documented ineffectiveness for the purchased asset case applies equally to fixed coupon liability hedges.[4] Fair value interest rate swap hedges of fixed income risk are fundamental in corporate investment and funding. For fixed income hedge items with matching-term swap hedges, FAS-133 SCM provides hedge accounting. Without remedy, IAS-39 does not.

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analyzing clean prices. Effectively, this method removes a fair value component from the hedge calculation, and is inconsistent with IAS 39.

[4] Following the EU Accounting Regulatory Committee (ARC) guidance, the EU has excluded many types of liabilities from the IAS 39 standard.

2) Ad-hoc Remedies

Our negative IAS-39 interest rate risk hedge effectiveness result may be partially remedied in five ad-hoc ways:

a) Have all swap reset dates on hedge effectiveness evaluation dates.
b) Hedge each fixed income CF and FV component separately with FRAs and not a swap. (A swap is, effectively, a portfolio of FRAs. a sequence of forward swaps might also be utilized.)
c) Use the cumulative hedge effectiveness test procedure, and have more floating-rate reset dates on the swap.
d) Dynamic hedge (IAS-39 F.1.9.)
e) Cash flow hedge

Relative to the FAS-133 short-cut method, all of these remedies have shortcomings:

a) Date Matching

With regard to the first method, matching swap floating reset dates with hedge effectiveness evaluation dates leaves the VRN value at par from one effectiveness evaluation date to the next. The matched swap hedge is 100% effective. To accommodate this fix, market convention must permit regular shortening or lengthening of the initial swap reset period. Also, swap floating-rate reset dates must match hedge effectiveness evaluation frequency.

Such changes will lead to hedge swap reset date bunching on effectiveness evaluation dates. Minimally, these dates are every fiscal quarter end. The associated payment/receipt lumpiness will cause short-term money market impacts. We understand that many firms will evaluate hedge effectiveness at month end.[5]

Another way to achieve effectiveness is to transform all current swaps with short-term basis swaps into receiving or paying overnight LIBOR. Clearly, this method ensures that any hedge effectiveness evaluation date is also a swap floating reset date. The basis swap fixed leg

[5] Eurodollar interest rate futures have middle of month reset dates. IAS-39 may negatively impact Eurodollar futures and other rate futures contract use.

would match the original swap hedge floating leg. Alternatively, outstanding swaps with floating legs longer than overnight could be renegotiated. However, swap renegotiation is not standard in the swap markets, and usually requires counterparty agreement.

b) Forward Rate Agreement Strips

Ineffectiveness may be ameliorated using strips of forward rate agreements for each of the swap reset dates. Importantly, these hedges must be separately designated as hedges of each expected cash flow. However, the mismatch of the FRA fixed payments or receipts against the hedge item coupons complicates this structure. Though it is natural to use non-par FRAs to eliminate these differences, a non-par hedge may not qualify as a hedge derivative (IAS 39-AG11, AG35(c)).

c) Cumulative Hedge Effectiveness

Under IAS 39 F.4.2, cumulative hedge effectiveness tests are permitted. If a long-term fixed income underlying is the hedged item, then initial hedge effectiveness may be sufficiently high to offset subsequent short-term hedge ineffectiveness.

With regard to cumulative effectiveness test success, we are not hopeful. To introduce this concern, we extend our analysis of the two-coupon bond hedge item/swap hedge case in a rudimentary manner.

The following Table reports local and instantaneous hedge effectiveness for bonds of varying maturities out to 30 periods. Local means that rates change a small amount and instantaneous means that time does not evolve. The sensitivity analysis is done for flat zero coupon discount rate curve changes.

Hedge Effectiveness Given Parallel Discount Rate Curve Shifts

Period by Period Evaluation (absolute values)

rates \ coupons paid (T)	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.25%	0.506	0.674	0.758	0.809	0.842	0.866	0.884	0.898	0.909	0.918	0.925	0.931	0.937	0.942	0.946
2.5%	0.500	0.666	0.749	0.799	0.833	0.856	0.874	0.888	0.899	0.908	0.915	0.922	0.927	0.932	0.936
5.0%	0.488	0.650	0.731	0.780	0.812	0.835	0.853	0.866	0.877	0.885	0.893	0.899	0.904	0.908	0.912
10.0%	0.464	0.617	0.693	0.738	0.767	0.787	0.801	0.812	0.820	0.826	0.831	0.835	0.838	0.840	0.842

rates \ coupons paid (T)	17	18	19	20	21	22	23	24	25	26	27	28	29	30
1.25%	0.949	0.952	0.955	0.958	0.960	0.962	0.964	0.966	0.967	0.969	0.970	0.971	0.972	0.973
2.5%	0.940	0.943	0.946	0.948	0.950	0.953	0.954	0.956	0.958	0.959	0.961	0.962	0.963	0.964
5.0%	0.916	0.919	0.921	0.924	0.926	0.928	0.929	0.931	0.932	0.934	0.935	0.936	0.937	0.938
10.0%	0.843	0.844	0.845	0.845	0.845	0.845	0.845	0.845	0.845	0.844	0.844	0.843	0.843	0.842

Cumulative Evaluation (absolute values)

rate\coupons	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.25%	0.811	0.827	0.840	0.851	0.861	0.869	0.877	0.883	0.889						
2.5%	0.805	0.821	0.834	0.845	0.855	0.864	0.871	0.878	0.883						
5.0%	0.806	0.82	0.832	0.842	0.851	0.859	0.865	0.871	0.877	0.881					
10.0%	0.808	0.819	0.829	0.837	0.843	0.849	0.854	0.859	0.863	0.866	0.869	0.872	0.874		
20.0%	0.8	0.806	0.81	0.813	0.816	0.819	0.821	0.823	0.824	0.825	0.827	0.827	0.828	0.829	0.829

rate\coupons	17	18	19	20	21	22	23	24	25	26	27	28	29	30
20.0%	0.83	0.83	0.831	0.831	0.831	0.831	0.832	0.832	0.832	0.832	0.832	0.832	0.832	0.833

For these calculations, the coupon, C, VRN rate, F_1, and all zero coupon discount rates, R, are, initially, set to the same value. The local change in the effectiveness test is calculated from the derivatives of the VRN and bond values with respect to a parallel change in the flat discount rate curve, R (t, C and F_1 held constant).

$$\text{Effectiveness} = \frac{-\Delta S_T}{\Delta B_T} = \frac{\Delta V_T - \Delta B_T}{\Delta B_T} = \frac{\Delta V_T}{\Delta B_T} - 1 = \varepsilon_T - 1$$

$$S_T = B_T - V_T, \quad B_T = \sum_{t=1}^{T} \frac{C}{(1+R)^t} + \frac{100}{(1+R)^T},$$

$$V_T = \frac{F_1\ 100}{1+R} + \sum_{t=2}^{T} \frac{{}_{t-1}R_t\ 100}{(1+R)^T} + \frac{100}{(1+R)^T} = \frac{(1+F_1)\ 100}{1+R}, \quad {}_{t-1}R_t = R$$

The key feature of the analysis is that hedge effectiveness is better at both low rates and long maturities. In analyzing the different cumulative effectiveness cases, we have reported the results for the minimum maturity that provides an effective hedge on an 80-125 effectiveness test basis. For example, in the 1.25% rate curve case, a bond with fewer than 10 coupon payments will have a cumulative effectiveness test ratio below 0.8. In the low rate and 10-coupon bond case that is reported, relatively high effectiveness at longer maturities (early in the hedge life) is sufficient to offset poor effectiveness at short maturities (late in the hedge life.) To be specific, reference the first period-by-period panel of the Table. In the 1.25% rate case, effectiveness for the 10 remaining coupon bond hedge is 0.909, and effectiveness falls to only 0.506 with two coupons remaining.

On a cumulative basis, these hedges may not be prospectively viewed to be "highly effective." "Highly effective" is defined to be a higher threshold ex ante than the ex post hedge effectiveness range of 80-125. (IAS 39 AG 105 uses the term "almost fully offset" for prospective/ex ante assessment. Also, see F.4.4. and F.4.6.)

Clearly, the hedge item and swap hedge cumulative value changes do not almost fully offset. Furthermore, our parallel rate curve shift analysis cannot be simply extrapolated to the more complicated rate curve shifts that will occur. Though our results suggest rules-of-thumb like having at least 10 resets in a swap hedge, such rules will fail. The term structure may always shift such that the short-term VRN component of the swap has a significant change in value while the bond component stays roughly constant. A protracted period of such movements cause cumulative ineffectiveness.

d) Dynamic Hedging

Since testing hedge effectiveness on a cumulative basis inevitably entails ineffectiveness, it is natural to consider dynamic hedging strategies that can improve effectiveness. A seemingly

simple way to do so is to state that a dynamic hedge will be undertaken and updated when swap ineffectiveness rises to a certain level.

The problem with this approach is that at any point in time the denominator of the effectiveness ratio test (the change in the hedged item value) may go to zero. Therefore, the only way to ensure hedge effectiveness on a dynamic basis is to ensure that no ineffectiveness occurs in the numerator of the hedge ratio. As discussed previously, this outcome requires eliminating variable rate note fair value volatility in the interest rate swap hedge.

e) Cash Flow Hedge

The FAS-133 short-cut method (SCM) for evaluating interest rate risk hedge effectiveness applies to both fair value hedges (FVH) and cash flow hedges (CFH). We have shown that IAS-39's omission of the SCM raises the likelihood of FVH ineffectiveness. The same is true for CFH.

In their treatment of interest rate risk hedges of held-to-maturity investments, both FAS-133 and IAS-39 highlight substitution between cash flow and fair value hedges. Since interest rate risk hedges of held-to-maturity investments are precluded, the standards suggest an alternative: The floating rate funding risk of these fixed-rate investments can be eliminated with cash flow hedges of the expected funding risk. Analogously, fixed-rate liability cash flow hedges are identified as reinvestment risk of floating cash balance reinvestment.

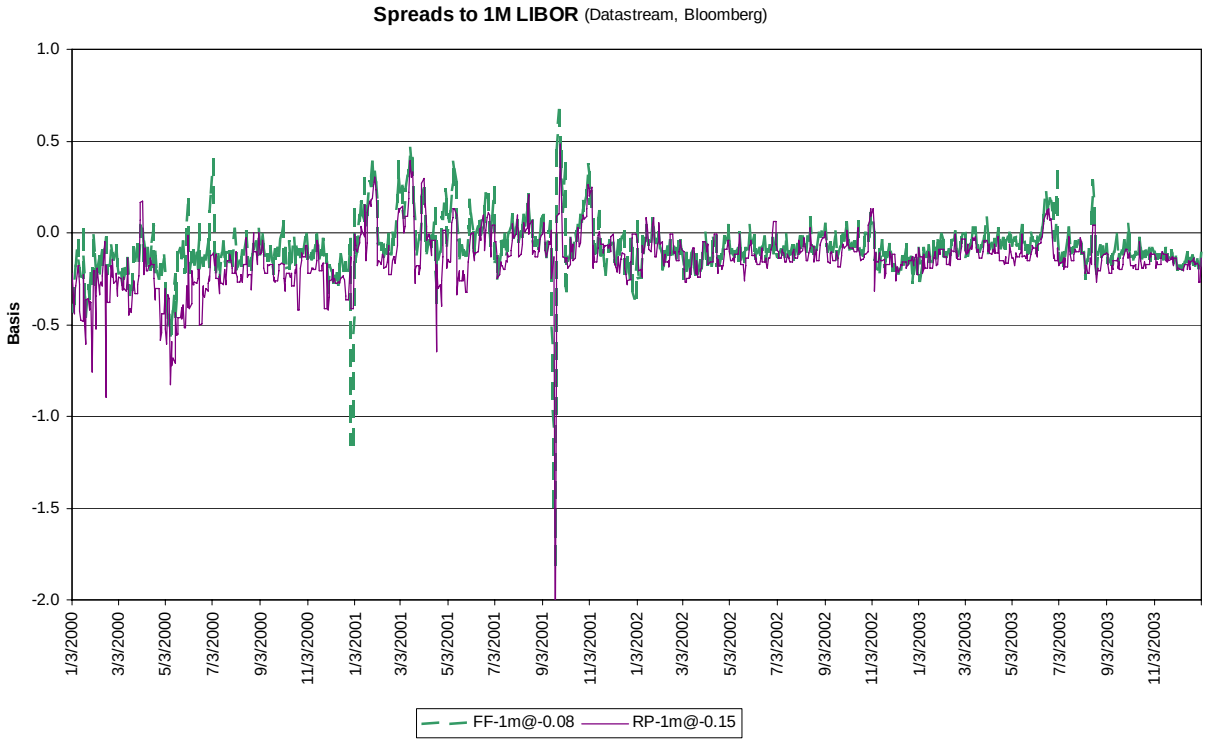
This cash flow hedge method also applies to trading assets and liabilities, available-for-sale assets and interest rate risk identified components of other assets and liabilities (such as bank loans and deposits.) However under IAS-39, such expected cash flow hedges are complex and face significant likelihood of failure.

Effectiveness failure will arise in matching actual funding and reinvestment cash flows with the swap floating rate indexed cash flow. For an asset hedge, asset funding is usually

conducted through domestic money markets, and not the London Inter-bank market that sets swap floating rates. The usual asset hedge transaction is a pay fix-receive floating one month LIBOR (London Interbank Offer Rate) referenced swap hedge of a U.S. Treasury bond asset. Under FAS-133, as long as the fixed coupon payment on the swap matched the tenor and rough size of the bond coupons, the hedge would qualify as SCM and be deemed 100% effective.

Under IAS-39, this hedge faces ineffectiveness because the U.S. Treasury bond purchase is often funded through a collateralized repurchase agreement (RP) or through Fed funds borrowing. In this case, realized funding costs won't match the floating rate in the swap.

The following figure plots the spreads between actual funding rates and one month LIBOR. Other LIBOR rates are equally variable and, on average, above the one-month rates. Therefore, spreads and variability between other LIBOR reference rates and Fed Funds or RP are even higher.



Relationships among these rates are not certain. Clearly, spread variation will cause ineffectiveness. From May 1991 through 2003, average one-month LIBOR spreads over Fed Funds and RP were 15 and 20 basis points, respectively. From 2000 through 2003, these average spreads fell to eight and 15 basis points, respectively.

With such variability and average differences, IAS-39 swap hedges of domestic rate-referenced funding and reinvestment will require significant monitoring. In fact, all ad-hoc fair value hedge remedies may have to be utilized to generate CFH effectiveness. Among the ad-hoc fixes, the one that is guaranteed to generate effectiveness is a basis swap from the reference LIBOR swap rate into the domestic money market rate. Currently, the Fed Funds swap market is not nearly as deep as the LIBOR market. A repurchase rate-linked swap market does not exist. [6]

For large financial institutions that fund in well-developed domestic financial markets, this situation will only be a nuisance. The nuisance is increased by the IAS requirement that all hedge transactions must be made externally. Therefore, once an entity identifies the domestic rate to be hedged, it can never move to another tenor of funding or reinvestment. Standard money management practices of lengthening and shortening cash funding and investment may be sacrificed for the sake of maintaining hedge effectiveness.

For smaller entities functioning in less-developed domestic financial markets, gaps between actual funding and reinvestment rates and LIBOR reference rates may be so great as to

[6] It has come to our attention that some knowledgeable parties argue that the one-month LIBOR risk in Fed Funds- or RP-based funding cannot be a "hedged item" because one month LIBOR is not "a portion of" of the domestic money market benchmark rates. Reviewing our figure, clearly, sometimes it is and sometimes it isn't. A literal restriction to "apportionment" will imply that no short-term benchmarks exist for collateralized (repurchase) funding transactions. We believe that the one month LIBOR, Fed Funds and RP rates are sufficiently close to permit hedge item designation of any of these benchmark rates as hedged items and derivatives contingent on the other risk as the hedge. With continuing global money market integration, differences between these rates are converging and will continue to converge. The markets are, effectively, substitutes. In accounting terms, any deviations will flow through the income statement and persistent or large deviations will result in ineffectiveness.

preclude any chance for an effective hedge. PriceWaterhouseCooper (PWC 2000) Example 11 realistically shows the likely effectiveness failure of a prime-rate funding swap hedge.[7]

A final difficulty in applying CFH for non-LIBOR referenced funding and reinvestment risks is that both prospective and retrospective hedge effectiveness evaluation requires calculation of the present value of all rate basis differences. Therefore, any future variation in rate spreads must be modeled and fair valued for hedge effectiveness tests. Needless to say, such estimation and data management activities will be onerous for many international entities that currently have effective interest rate risk hedges. Under FAS-133 SCM, none of these difficulties exist.

3) Implementation Guidance-Based Remedy

IAS 39 is a "principles-based" standard. It is not a "rules-based" standard. Since one of the ad-hoc remedies for interest rate risk hedge ineffectiveness is pure financial structuring or restructuring, we are troubled. Only the cumulative hedge test alternative seems fundamental.

To our knowledge no solution to this problem has been recognized. However, we believe that IAS 39 – F.5.5 points to a fundamental remedy to the interest rate risk-hedging problem, the Method B theoretical swap:

> Under Method B, the present value of the change in cash flows is computed on the basis of the difference between the forward interest rates for the applicable periods at the effectiveness measurement date and the interest rate that would have been obtained if the debt had been issued at the market rate that existed at the inception of the hedge.

For the hedge of an outstanding fixed income claim, the phrase is amended:

> Under Method B, the present value of the change in cash flows is computed on the basis of the difference between the forward interest rates for the applicable periods at the effectiveness measurement dates and the market interest rate that was obtained when the debt was issued at the inception of the hedge.

[7] This example transaction is actually a cap hedge. However, the intrinsic value of the option is designated as the hedge. Therefore, hedge effectiveness becomes equivalent to a swap rate-fixing hedge.

The method is further described as follows:

> This method also could be referred to as the 'theoretical swap' method (or 'hypothetical derivative' method) because the comparison is between the hedged fixed rate on the debt and the current variable rate, which is the same as comparing cash flows on the fixed and variable rate legs of an interest rate swap.

The IAS example also presents another method (A), and this method is analogous to the swap hedges already considered. In the IAS example, both methods are 100% effective because the hedge evaluation date is also a reset date.

Between IAS-39 Implementation Guidance F.5.5. Methods A and B, and specifically with regard to hedge effectiveness, Method B is preferable. By identifying the fair value of the cash flows being hedged as the expected difference between the swap market fixed rate and floating-variable forward reference rates, the hedged fair value is equivalent to the swap fair value.

Hedge item separation and identification is done in the following manner. The bond expected cash flows are separated into the hedged item value, B_h, and an unhedged component value, B_u,. The fair values of each part are calculated from benchmark spot and forward interest rates:

$$B = B_H + B_U,\ B_H = \frac{C - F_1\ 100}{1 + R_1} + \frac{C - {}_1R_2\ 100}{(1 + R_2)^2},\ B_U = \frac{F_1\ 100}{1 + R_1} + \frac{(1 + {}_1R_2)100}{(1 + R_2)^2}$$

The separate hedge item cash flows, B_h, exactly match hedging swap cash flows. Therefore both cash flow (CFH) and fair value (FVH) hedges of interest rate risk are 100% effective under the F.5.5 Method B. Appendix A provides an example for a particular interest rate risk hedge. Our proposed interest rate hedge identification is IAS-39 admissible. Furthermore, it provides convergence between IAS interest rate swap hedge treatment and FAS-133 short-cut treatment.[8]

[8] For FAS-133 admissible SCM hedges, the Standards converge. Nevertheless, our proposed IAS-39 implementation is more broadly applicable than the SCM. FAS-133 doesn't seem to permit identification of this type of interest rate risk hedge. Since only contractual cash flows may be hedged (not expected cash flows as in

The proposed swap hedge effectiveness method is relevant for available-for-sale (AFS) fixed income assets and self-originated or purchased loans, as well as liabilities. If the hedged item is assigned to the IAS-39 "trading" or "other trading" classifications, derivatives and hedge items fair value changes flow through income. In this case, our hedge effectiveness distinctions are unnecessary. Our implementation is also not relevant for held-to-maturity (HTM) assets because interest rate risk hedges of HTM assets are not permitted.

Hedge effectiveness determines whether asset gains and losses offset swap losses and gains, or the swap losses and gains are booked fully in income. We have a simple example:

Ineffective Swap Hedge Without Method B	Debit	Credit
Swap loss (I)	100	
Swap (B)		100
AFS Bond Gain (E)		60
AFS Bond (B)	60	

Effective Swap Hedge With Method B	Debit	Credit
Swap loss (E)	100	
Swap (B)		100
AFS Bond Hedge Item Gain (E)		100
AFS Bond Unhedged Component Loss (E)	40	
AFS Bond (B)	60	

I - Income Statement, B -Balance Sheet, and E – Equity.

It might appear that this difference is only one of accounting. However, BIS Market Risk rules result in a very large difference between these two methods for bank capital calculations, OCC (2002).

> (7) *Common stockholders' equity* means common stock, common stock surplus, undivided profits, capital reserves, and adjustments for the cumulative effect of foreign currency translation, less net unrealized holding losses on available-for-sale equity securities with readily determinable fair values.

IAS-39), the SCM is all that is available: FAS-133 Fair Value Hedges 21.a.2.b. "One or more selected contractual cash flows (such as the portion of the asset or liability representing the present value of the interest payments in the first two years of a four-year debt instrument)." 21.a.2 concludes "If the entire asset or liability is an instrument with variable cash flows, the hedged item cannot be deemed to be an implicit fixed-to-variable swap (or similar instrument) perceived to be embedded in a host contract with fixed cash flows." IAS-39 (78.-81.) is not restricted to "contracted cash flows" and does not exclude "implicit fixed-to-variable swaps." Instead and explicitly, this fixed-to-variable swap hedge is the IAS-39 "theoretical swap" of F.5.5 Method B.

For bank capital purposes, the ineffective swap hedge case will result in a loss, a decrease in retained earnings and stockholders' equity. The Method B accounting doesn't affect income and retained earnings. Furthermore, only equity AFS security-related credits go against bank capital. Therefore, the Method B un-hedged fixed income asset component loss in OCI/equity does not decrease stockholders equity and bank capital.[9]

This distinction provides a clear rationale for European Union reluctance to apply IAS-39 (and related IAS-32.) Under FAS-133, U.S. banks have not faced decreased equity and increased bank capital requirements from swap losses that have been designated as SCM hedges of AFS or self-originated loan assets.

This concern is exacerbated by the current state of most hedged bank loan and asset portfolios. With the significant decrease in global interest rates over the last two decades, bank held-to-maturity (HTM) and AFS fixed income assets have gains and the hedging swaps that fix bank short-term variable rate funding costs, generally, have large losses. Since many IAS-39 interest rate risk hedges are likely to be ineffective, adoption implies that large swap losses will be recognized and limit bank capital. Of course, this capital reduction may be offset with AFS asset and loan sales. Nevertheless, the securitization market in Europe is likely to be severely stressed in the short- and even medium-term by such an offering load. Other potential adopters of both IAS and BIS rules have even less developed securitization markets.

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[9] We neither address questions of how much bank capital is adequate, nor the appropriateness of "fair value" accounting. For a recent position on bank capital adequacy, see "The Coming Storm," The Economist, February 19th, 2004. Hodder, McAnally and Kohlbeck (2002) document bank responses to SFAS 115 implications for bank regulatory capital. See their reference list for other work accounting rule change implications; as well as Barth, Beaver and Landsman (1996) and Park, Park and Ro (1999) on the valuation efficacy of disclosures.

4) Market-Based Remedy

If our identification of the Method B interest rate hedge item is deemed to be inconsistent with IAS-39, then a chasm exists between this standard and FAS-133. Though the European Union (and the rest of the world) has amended it's IAS 39 adoption, the standard will apply to asset hedges.

With IAS-39 standards, financial engineering based-remedies are readily available.[10] The most direct hedge derivative might be called the "hedge effective swap." Such a structure would simply add back the variation of the swap variable rate note component from the transaction. At inception, this added feature has zero fair value because the variable rate note is at par. If a hedge evaluation date occurs prior to a reset date, then any over/under effectiveness on the swap will be owed to/receivable from the effective swap counterparty. Generally, such counterparties will be on a mark-to-market trading basis.

The "hedge effective swap" is an improvement on the one ad-hoc remedy that is sure to work: adding overnight basis swaps to outstanding swaps with longer term floating legs. The hedge effectiveness swap would meet hedging needs, while minimizing overnight interest payments and other flows.

"Hedge effectiveness collars" are another potential innovation. The cash flows paid or received on these derivatives would only be made when effectiveness was jeopardized. For the asset hedge, a call would be sold on VRN gains when the gains jeopardize the upper hedge effectiveness bound, and a put would be bought on VRN losses when the gains jeopardize the upper hedge effectiveness bound.

By setting the loss levels appropriately and ensuring a condition for immaterial hedge item changes (not equal to zero), the sold call and bought put values may result in a zero-cost

[10] Analogously, Bodurtha-Thornton (2002) provide a market-based remedy for FAS-133 treatment of option time values. They also argue for a change in FAS-133 that would eliminate the need for this innovation.

collar. Though the cash flows derived from this collar are not monotonic in interest rate movements, the collar values may be determined in any two factor interest framework.[11]

A final alternative is to add a particular liability to the asset hedge item and swap hedge portfolio. The liability would be a time deposit with the same rate as the first swap floating leg. All components of this transaction would be assigned to the trading or other trading IAS-39 classifications. The mark-to-market for these transactions results in no interest rate risk-related profit or loss. The short-term liability in this position must be rolled over on each swap-reset date. The problem with this remedy is the huge increase required in short-term bank liabilities. With such increases, credit indentures and regulatory capital limits could be breached. In the U.S., FAS-133 interest rate risk SCM mitigates these concerns.

5) Conclusion

Current interpretations and guidance for IAS-39 interest rate risk hedges will result in significant and random hedge ineffectiveness. Since the IAS Board (BC132-136) has strongly rejected the alternative SFAS-133.63 interest rate hedge short-cut method, the standards differ substantially. Furthermore, this difference has implications under contract terms, compensation agreements and capital adequacy regulations that are extraordinary.

We have proposed, ad-hoc, Implementation Guidance-based, and market-based remedies to this problem. The ad-hoc remedies are either potentially ineffective or require changes in financial management practice that will be costly for large market participants and, potentially, infeasible for smaller entities. The market-based remedies, while feasible, will have costs and, again, may not be available to smaller entities.

Our recommended remedy is a particular interpretation of a distinction already in the Standard Implementation Guidance, F5.5. If an entity is permitted to designate the fixed coupon

[11] See Brennan-Schwartz (1982), Heath-Jarrow-Morton (1992), Duffie-Kan (1996), and Hull-White (1994).

less forecasted/forward floating rate as the hedged fixed income expected cash flow, then for sufficiently matched contract terms the associated swap hedge will be 100% effective. In this simple manner, the interest rate hedge effectiveness portions of IAS-39 and FAS-133 may, effectively, converge.

Appendix A: IAS-39 Guidance F.5.5. Method B Interest Rate Hedge

Situation: a/o 9/30/2003, IAS 39 consequences for 6.63% semi-annual amortizing asset with a 6.03% pay fixed rate-receive 6M LIBOR swap hedge. Given interest changes in October 2003, effectiveness is evaluated a/o 10/31/2003.[12]

Summary: For appropriately defined hedged item cash flows, the "theoretical swap" CFH of F.5.5. will be highly effective for loans. Exact matching of asset and swap amortization schedules and identification of the appropriate hedged item yield 100% effectiveness.[13]

Current IAS-39 Ineffective FVH

Hedged Item: All Amortizing Principal Asset Cash Flows – Asset Coupon Receipts and Principal Repayment[14]

Derivative Hedge: Matched Notional Pay Fix/Receive Float Swap

9/30/2003 Expected Cash Flow Date	6.63 Coupon Interest Receipt	Principal Payment	6.03 Pay Fixed Swap Net Cash Flow	Forward Rates	**10/31/2003** Forward Rates	6.63 Coupon Principal & Interest Receipt	6.03 Pay Fixed Swap Net Cash Flow
11/17/2003	34,339	207,176	(24,542)	1.250%	1.134%	241,515	(24,542)
5/17/2004	27,471	207,176	(20,170)	1.149%	1.227%	234,647	(19,844)
11/15/2004	20,604	207,176	(14,359)	1.394%	1.731%	227,779	(13,299)
5/16/2005	13,736	207,176	(8,145)	2.075%	2.566%	220,911	(7,118)
11/15/2005	6,868	207,176	(3,258)	2.838%	3.301%	214,043	(2,770)
Gross Fair Value	1,119,976		(69,761)			1,118,126	(66,902)
Δ Fair Value						**(1,850)**	**2,860**
Effectiveness							**-155%**

Since the total asset fair value changes swamp the swap fair value change, the swap would have been an ineffective hedge. Given this analysis, such a swap will not qualify for FVH effectiveness under IAS-39. Any forecast analysis on September 30, 2003 would have identified this "likely" ineffective outcome. There is no high likelihood of hedge effectiveness.

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[12] We thank SG DEFI ACFI and RISQ groups for providing us with this example and the necessary data for its analysis.

[13] For other FVH, ineffectiveness may result because a swap hedges only the fixed rate to LIBOR forward spread risk of the asset coupons. Both loan principal repayments and the outright rate risk in the asset coupon cash flows are not hedged by the swap. The fair value changes in these asset value components move differently enough from the swap to induce ineffectiveness.

[14] From November 2003 to November 2005, $1,035,878 asset principal is repaid semi-annually, $1,035,878/5=$207,176. Semi-annual coupons are paid on the outstanding principal. For 11/17/2003, the 6.63% interest receipt is $1,035,878 x 0.0663/2 = $34,339. The 11/17/2003 forward rate was 1.148%. The listed 11/17/2003 forward rate is the "sticky" initial swap reference-floating rate that was set on the last swap reset date, 5/15/2003. The swap Net Cash Flows are the 6.03% fixed coupon less the listed forward rates. The first net swap Cash Flow is $1,035,878 x (0.0603/2 – 0.0125*(186/360)). 186 is the number of days in the 5/15/2003-11/17/2003 basis period. These Cash Flows are gross fair values and accrued interest is not netted from these values. Discounting is done with spot rates corresponding to actual/360 forward rates.

Highly Effective F.5.5. "theoretical swap" FVH

Hedged Item: "Theoretical Swap" LIBOR Fixed Rate Coupon Component Less Forward Rate Spread - Asset Coupon (6.63%) Less Credit/Liquity/Marketability Spread over LIBOR (0.60%) Less Forward Rate[15]

Derivative Hedge: Matched Notional Pay Fix/Receive Float Swap

9/30/2003 Expected Cash Flow Date	6.63 Coupon Less 0.60bp & Less Forward	Principal Payment	6.03 Pay Fixed Swap Net Cash Flow	Forward Rates	**10/31/2003** Forward Rates	6.63 Coupon Less 0.60bp & Less Forward	6.03 Pay Fixed Swap Net Cash Flow
11/17/2003	24,542	-	(24,542)	1.250%	1.134%	24,542	(24,542)
5/17/2004	20,170	-	(20,170)	1.149%	1.227%	19,844	(19,844)
11/15/2004	14,359	-	(14,359)	1.394%	1.731%	13,299	(13,299)
5/16/2005	8,145	-	(8,145)	2.075%	2.566%	7,118	(7,118)
11/15/2005	3,258	-	(3,258)	2.838%	3.301%	2,770	(2,770)
Gross Fair Value	69,761		(69,761)			66,902	(66,902)
Δ Fair Value						**(2,860)**	**2,860**
Effectiveness							**-100%**

High effectiveness is both expected and achieved under this hedge identification and implementation approach. Carrying the example forward to November month end, the effectiveness test level is 100%. Should October 2003 be a quarter or fiscal year-end, then income statement and balance sheet entries will be made. With regard to the actual accounting entries made for this hedge, IAS-39 (like FAS-133) leaves fairly wide discretion.[16]

Prospective and retrospective effectiveness evaluation may not be a trivial exercise for many entities. Careful modeling of forward rates, accruals and discount rates are necessary to identify and evaluate effectiveness. Nevertheless, effectiveness evaluation results will be 100% effective for swap hedges that meet FAS-133 SCM requirements. Therefore, we suggest that materiality considerations imply that these hedges need not be reevaluated for effectiveness after initiation and prospective effectiveness demonstration. Actually, even this documentation is unneeded because any hedge effectiveness variability will be immaterial.

With regard to the actual accounting entries made for this hedge, IAS-39 (like FAS-133) leaves fairly wide discretion.

[15] From November 2003 to November 2005, $1,035,878 asset principal and swap notional principal are repaid semi-annually, $1,035,878/5=$207,176. The 11/17/2003 forward rate was 1.148%. The listed 11/17/2003 forward rate is the "sticky" initial swap reference-floating rate that was set on the last swap reset date, 5/15/2003. Both the identified and separated asset hedged Cash Flows and the swap Net Cash Flows are the 6.03% fixed coupon less the listed forward rates . The first net swap Cash Flow is $1,035,878 x (0.0603/2 – 0.0125*(186/360)). 186 is the number of days in the 5/15/2003-11/17/2003 basis period. These Cash Flows are gross fair values and accrued interest is not netted from these values. Discounting is done with spot rates corresponding to actual/360 forward rates.

[16] "A company could elect to do their bookkeeping using the synthetic-style entries. Fas-133 and IAS-39 do not address 'geography' of recorded amounts." (E&Y, 2001, pg. 5.26.)

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