

Bank Asset/Liability Management

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Choosing Between Interest Rate Swaps and Eurodollar Strips

The classic bank portfolio pairs longer-duration assets with shorter-duration liabilities and, given this structure, it is understandable that managers would turn to interest rate swaps as a primary risk management tool. In such cases, swaps could be used to synthetically shorten the duration of the assets or, alternatively, to lengthen the duration of the liabilities. Moreover, the same instrument would likely be used with either orientation.

Consider the most simplified example of a single, three-year fixed rate loan, funded by rolling over three-month LIBOR-based deposits. Assuming no prepayment options for the asset, it should be clear that a *pay fixed/receive float* interest rate swap would largely, if not perfectly, eliminate the interest rate risk of this asset/liability combination. In this case, the swap could be thought of as a hedge of the loan, whereby the loan would be transformed into a synthetic variable rate asset; or, alternatively, the swap could be thought of as a hedge of the rollover funding risks, whereby the variable interest rate funding would be transformed to synthetic fixed rate funding. In either case, the swap would serve to preserve a predetermined interest rate margin.

Despite the flexibility to think of this hedge as either the hedge of the fixed rate asset or the hedge of funding rollovers, the accounting considerations generally favor the latter orientation. This preference derives from the fact that, most likely, special hedge accounting would be desired, whereby the gains or losses of the derivative would be recognized in the income statement concurrently with the earnings recognition of the risk being hedged. The rules of hedge accounting, however, differentiate the treatment for these two respective hedging orientations.

Specifically, if the bank considers the hedged item to be a fixed rate loan, the accounting treatment of choice would be *fair value* hedging. On the other hand, if the hedged item were the uncertain interest expenses relating to the funding, *cash flow* hedge accounting would follow.

For the purposes of this article, it is not necessary to go into the details of these accounting treatments; but, suffice it to say,

fair value hedge accounting has some problems. To qualify for this treatment, the hedger has to assert that the swap's result will be *highly effective* in offsetting the risk being hedged. While this claim may be valid in the short run, the assertion will not hold over the horizon of the hedge. The illegitimacy of this claim in the long run can be readily understood by returning to the example of the three-year fixed rate debt hedged with a three-year *pay fixed/receive fixed variable* swap.

Assume both the debt and the swap are initiated coincidentally. The swap's gain or loss over the hedge horizon will simply be the sum of the settlements made throughout the swap's life. On the other hand, the debt would typically be issued at par and ultimately redeemed at par. Thus, at the start of the hedge, it is a foregone conclusion that the hedged item will realize a *zero* change in fair value throughout the hedge. The prospect of the swap's gain or loss summing to zero, however, is nil. It will not happen.

Some institutions may be able to avoid this difficulty with fair value hedges by qualifying for and applying the *shortcut* treatment. Officially, shortcut is a special treatment that is available under GAAP when very specific criteria are satisfied, but auditing firms have discouraged its use. Their concern appears to be that one of the technical qualifying conditions might not end up holding throughout the term of the hedge, thereby disqualifying the treatment some time along the way. The alternative is to use the *long haul* method; but, unfortunately, the long haul method falls prey to the pitfall referenced above.

That leaves us thinking about the hedge as a cash flow hedge of uncertain interest payments. At this point, it is useful to realize that, as an alternative to an interest rate swap, the hedging entity might consider entering into a strip of Eurodollar futures contracts. While the swap locks in a common interest rate for all of the accrual periods covered by the swap, each futures contract locks in an individual rate for each prospective rollover funding. Economically, the two outcomes will generally be quite comparable, in that the *effective* term rate from a strip of Eurodollar futures should be quite close to the fixed rate on the contemporaneously available swap.

Futures contracts clearly have some institutional aspects that have to be understood – like the requirement to post collateral (initial margin) and the need to settle gains or losses daily, in cash (variation margin). But, economically, futures are just standardized forward contracts that are traded on an exchange.

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Being standardized, the futures strip generally will not perfectly correspond to the accrual periods associated with the hedged item, so the futures hedge will involve at least some degree of uncertainty, i.e., some variance between the rate that you would expect to realize *ex ante* and the actual effective rate realized, *ex post*.

Swaps allow for more customization, where dealers accommodate to the needs of their customers and set the terms of their swaps accordingly. A perfectly constructed swap hedge, therefore, should deliver the advertised fixed rate or, in the language of the accounting literature, a hedge with zero ineffectiveness. Critically, differences between the effective fixed rate realized with a futures strip will not have a *systematic* difference from the fixed rate of the swap. Sometimes the futures outcome will be better; sometimes worse.

Assuming these institutional aspects are understood and deemed to be workable, the choice of the swap over the futures, or vice versa, should consider your preference for when you would prefer the derivative's earnings to be recognized. With the swap, the same interest expense would be recognized in earnings each quarter (assuming that a perfectly structured hedge and cash flow hedge accounting is applied), while with futures, each quarter's expense would differ.

Precisely when the costs or benefits from the futures' results hit the income statement depends on a further election by the hedging entity. Specifically, the accounting rules allow for some discretion in terms of when *forward points* are recognized in earnings. For Eurodollar futures, forward points are the difference between the spot three-month LIBOR and the forward LIBOR reflected in the futures price. To illustrate, you must first realize that the forward interest rate reflected by the futures contract price is found simply by subtracting that futures price from 100. For instance, if a futures contract were traded at a price of 99.60, that price would correspond to a forward interest rate of 0.40% (= 100.00 – 99.60). And if the spot three-month LIBOR were 0.30% at the start, the starting forward points would be 0.10 or 10 basis points.

In general, with an upward sloping yield curve, forward interest rates move higher and higher as you extend out on the resetting horizon; and conversely, forward interest rates move lower and lower with an inverted yield curve. Suppose, for example, we confine our attention to four, quarterly resets and assume the following, upward sloping yield curve conditions (see Exhibit 6).

Exhibit 6. Calculating Forward Points

	<i>Price</i>	<i>Rate</i>	<i>Forward points</i>
Spot 3-mo. LIBOR	NA	0.30%	NA
Nearby Futures	99.60	0.40%	0.10%
Second quarter's future	99.50	0.50%	0.20%
Third quarter's futures	99.40	0.60%	0.30%
Fourth quarter's futures	99.30	0.70%	0.40%

In the first instance, the accounting treatment recognizes the expenses quarter by quarter, directly from the starting forward interest rates – again, of course, subject to the variability previously discussed, relating to the mismatching of the accrual periods due to the standardization of the futures contracts. That is, we should expect to realize graduated costs, quarter by quarter, starting at about 0.40% in the first quarter being hedged and rising by about 10 basis points each period. Essentially, the interest costs reflected on the income statement would directly follow from the *Rate* column in Exhibit 6.

In the second instance, forward points would be separated from the forward rates and accounted for on a current basis. That is, changes in forward points are measured each and every quarter, with those changes reflected in current income. These effects are then simply added to the starting spot LIBOR to project the expected, realized expense each quarter. To demonstrate the outcome under this approach, we simply assume that, on average, the forward points will erode by 10 basis points each quarter, for each contract. This 10 basis point adjustment applies to all four of the futures contracts in the strip at the start of the hedge but, subsequent to the first contract's expiration, the adjustment applies only to three contracts; and then two; and finally one. Thus, the election to explicitly account for forward points, separately, generally imposes the largest effect on the closest interest reset and a declining effect as we proceed in time. For the four successive quarters being hedged, a baseline outcome is shown in Exhibit 7. We assume a starting three-month LIBOR of 0.30% and the average (expected) forward point adjustment to be 10 basis points per quarter, per contract.

In this example, reflecting an upward sloping yield curve, accounting for forward points on a current basis exaggerates the cost in the early period with the effect dampening over time. Thus, the expected costs start high and move lower – exactly the opposite of the result that would have been realized if forward points were *not* separated from the full futures price.

It is important to appreciate that the outcome for this second scenario (recognizing forward points on a current basis) may be an artifact of the example. Specifically, the assumption that forward points would decline each period by 10 basis points for each contract is simply a baseline calculation, but one that is not likely to be realized. Actual adjustments will depend on the way the yield curve changes over time – something that is extremely difficult to predict with any high degree of confidence. In any case, sometimes the forward pricing

configuration will foster more meaningful earnings consequences; sometimes less.

This example assumed an upward sloping yield curve and it showed effective funding costs that were higher than the starting level of three-month LIBOR. In the first treatment, when forward points are not treated differentially, costs start low

Exhibit 7. Excluding Forward Points

	Spot LIBOR (at Start)	Forward Points (at Start)	Expected Cost of Funds
First Quarter	0.30%	0.40%	0.70%
Second Quarter	0.30%	0.30%	0.60%
Third Quarter	0.30%	0.20%	0.50%
Fourth Quarter	0.30%	0.10%	0.40%

and rise over time; while in the second treatment with forward point effects recognized on a current basis, costs start high and move lower. With an inverted yield curve, exactly the opposite occurs. First of all, the overall cost of funds would be lower than the starting three-month LIBOR; but again, costs would vary quarter by quarter. When forward points are not treated separately, the costs of funds start high and move lower as time progresses; conversely when forward point effects are recorded on a current basis, the costs start low and move higher.

These forward point impacts aside, for virtually any futures hedge, some further income volatility should be expected due to ineffectiveness arising because the accrual periods for Eurodollar futures will not precisely match those of the hedged item. The magnitudes of these ineffective earnings amounts, however, are largely unpredictable.

One further observation relevant to the futures versus swap consideration has to do with balance sheet presentations. The carrying value of a swap should be its liquidation value which, in turn, should be the present value of anticipated future cash flows. For futures, on the other hand, carrying values should be zero, for all practical purposes. Because futures gains and losses are settled daily in cash, gains or losses should be reflected in cash balances – not as non-zero market values for futures positions. Put another way, with each cash settlement, the market value of a futures position reverts to a zero value. Thus, the carrying value of the futures position at each quarter-end should be an amount equal to the next day's settlement value. More likely than not, unless the final day of the quarter posts a large market move, this one day settlement amount would be lost in the rounding in any balance sheet presentation.

Conclusion. The moral of this story is that, if reducing income volatility is the primary hedge objective, the swap would likely be the preferred derivative instruments, but do not reject the use of futures too precipitously. Futures may have a considerable advantage over swaps because of their liquidity. While most swap users tend to maintain their positions through their swaps' termination dates, that is generally not the case for futures users. Those who hedge or trade with futures contracts tend to assess their positions on an ongoing basis, and it is not unusual for positions to be adjusted – up or down – with changing market conditions or new information. It is not that you cannot necessarily liquidate swap contracts early, but doing so likely involves a special pricing negotiation with your original dealer in

a way that is less than fully transparent, where the benefit of competition may be sharply compromised.

Early hedge terminations or adjustments to hedge positions, of course, are somewhat of a double-edge sword, in that each such transaction can end up hurting rather than helping. Put another way, there is no guaranty that the increased attention and more frequent adjustments will necessarily translate to enhanced results; but there is something less than satisfying about an *automatic pilot* orientation that maintains a hedge position, come-what-may. Some portion of the hedging community should find the greater flexibility afforded by futures contracts to be attractive on that basis and worthy of forgoing at least some measure of income stability.

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