Hedging Bank Portfolios: Framing the Issue

Conceptually, hedging a bank's balance sheet from the effects of interest rate changes is pretty straightforward. We can think about addressing this concern in one of two ways: either we can assess the duration or interest rate sensitivity of the portfolio as a whole and simply overlay derivative positions in such a way as to adjust that exposure to some desired, targeted level; or we can think of using derivatives to synthetically extend or shorten the maturities of existing asset or liability positions in an effort to achieve a desired balance sheet exposure.

The first of these approaches may or may not adequately protect the hedger from non-parallel yield curve shifts, depending on the manner in which the derivatives positions are assembled. The second approach should be less susceptible to this shortcoming. In either case, traditional textbook hedging strategies will generally only protect against the effect of benchmark interest rate changes, doing little or nothing to compensate for gains or losses due solely to changes in credit spreads.

A Starting Point. When maturities and liability maturities are aligned, such that both re-set their respective interest rates concurrently, the bank can reasonably consider itself to be immunized from the effects of interest rate changes, again, save for the effects associated with changes in credit quality. With this perspective, it is easy to understand that the traditional textbook hedging strategy would be to use derivatives to alter the maturity structure of one side of the balance sheet or the other, synthetically, in order to mitigate or eliminate the extent of these mismatches, i.e., consistent with the second hedging orientation. In the typical case, banks hold longer-term fixed rate assets funded by shorter-term fixed rate liabilities. Such banks are thus exposed to the risk of higher interest rates when their liabilities roll over, in which case interest margins would be squeezed or possibly forced into negative territory. The solution would be either to extend the maturities of the liabilities or to shorten the maturities of the assets.

We have to start by deciding how much of the portfolio we want to hedge, i.e., the volume of assets and liabilities that we want to synthetically pair. Clearly, management can apply hedging to the proportion of its portfolio of its choosing — anywhere from 0 to 100 percent. While there is no unambiguously correct proportion of the portfolio to hedge, the determination should reflect judgments about (a) the likely course of future interest rate moves, (b) the potential consequences of seemingly low probability interest rate scenarios (e.g., value at risk considerations), and (c) some assessment of the way in which the bank's competitive peer group is likely to be positioned. In any case, the decision as to how much of the portfolio to hedge the portfolio sets the scale of the hedging activity, i.e., the volume of assets and liabilities to address.

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The Next Step. We then assemble specific assets and liabilities that we would want to hedge. The assets would be characterized as having outstanding balances throughout their intended holding periods and/or associated reset dates. The reset dates could be either a genuine reset date if the asset re-prices throughout its life, or it could be the maturity date of the asset, when it presumably would be replaced by a new asset that would yield the then-prevailing market interest rate. By hedging, we seek to pair each selected asset or asset grouping with a synthetic liability with matching outstanding values throughout the period until the assets' reset dates.

To illustrate, consider a simplified example where a bank relies on monthly deposits as its primary funding source in connection with its holding of a new, two year fixed-rate asset. Further, the asset is assumed *not* to be prepayable, such that the outstanding principal can be assumed to be constant throughout the asset's life. To fully hedge this portion of the balance sheet, we would seek to employ a derivative that serves to synthetically match the terms of the assets to those of the liabilities.

Most likely, the first hedging instrument that would be considered for this application would be an interest rate swap, paying fixed and receiving floating. This swap would have notional value equal to the principal amount outstanding on the asset. The swap's start date would be set equal to the very next reset date for one-month deposits, and its end date would be equal to the asset's maturity (or reset) date, two years hence.

We can think of this swap as either extending the maturities of the bank's liabilities or, alternatively, shortening the

maturities of the assets. Either way, the end result would be to lock in the bank's net interest margin net of any changes due to variability of credit spreads. The measure of the expected net interest margin would depend on the swap's fixed rate at the time the derivative is entered into, which would simply be a function of the market conditions as of the trade date. Entering into a swap with a lower fixed rate would necessarily yield a higher expected net interest margin result than that which would arise if the trade required a higher fixed rate on the swap.

Critically, the swap isn't the only hedging derivative that we might consider using. We might also hedge by buying a cap or constructing a collar (i.e., buying a cap and simultaneously selling a floor), covering the same horizon as that covered by the swap. Each of these alternative derivative types would constrain or alter the net interest margin in different ways — the cap would assure a lower bound on the resulting net interest margin, with the possibility of ending up with a more profitable outcome; and the collar would constrain the net interest margin between upper- and lower-boundary conditions. As with the swap hedge, the precise outcomes will depend on the pricing of these derivative contracts at the time they are traded.

Of course, the above example would need to be modified if the starting assumptions failed to reflect real world considerations. For instance, if the selected assets were prepayable, we would want the swap to have an amortizing notional amount consistent with our prepayment expectations. Clearly, though, to the extent that those expectations fail to be realized, we would end up being over- or under-hedged, depending on the direction of the error. Additionally, the hedge construction implicitly assumes that one-month deposits are rolled over on a common renewal date. While this assumption may not hold, this consideration would not affect the way we construct the hedge. It does, however, create another source of uncertainty in terms of the way the hedge may likely perform. That is, if the deposits do not uniformly align with the reset rates on the derivative, some measure of unexpected earnings impacts would have to be expected.

Accounting Considerations. Although the hedge strategy under consideration is really a hedge of the overall bank portfolio, when it comes to accounting considerations, we are forced to examine the issues through a different lens. Assuming the bank has elected *not* to apply fair value accounting (which is the choice made by most banks), hedge accounting is often paramount, as this accounting treatment results in earnings from the derivative to be reported concurrently with the earnings relating to the risks being hedged. This pairing of the hedge relationship's earnings effects would likely result in lower reported income volatility, which most banks would tend to prefer. Applying hedge accounting, however, forces us to define and document that we are hedging a single *hedged item*, rather than hedging the bank's overall portfolio. In this case, the eligible hedged item could be either (a) the fixed rate assets or (b) the uncertain interest payments relating to rolling over our deposits.

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With the former orientation, *fair value* hedging treatment would apply; with the latter, *cash flow* hedging would apply. Both result in the concurrent earnings recognition of the hedged item and the hedging derivative, but in different ways. For fair value hedges, the two earnings effect of the hedging relationship (i.e., those of the derivative and those of the hedged item) are reported in the current accounting period. In other words, the price effects on the asset due to interest rate changes are accelerated in earnings. On the other hand, cash flow hedges defer the earnings recognition for gains or losses on the derivatives, to the extent that they are effective, until the period when the interest expenses on our liabilities are realized.

Neither of these hedging alternatives is without its challenges in terms of qualifying for the desired accounting treatment. Fair value hedging is problematic because of the FASB's restrictive requirements relating to portfolio hedging. That is, most banks would likely think of hedging asset portfolios, as opposed to single loans or securities; but the fair value hedge accounting rules for how such portfolios must be constructed require an extraordinary degree of homogeneity. The cash flow hedges can also be problematic for banks, as the yield on funding sources (typically deposits) is likely to be *other than* benchmark interest rates. Thus, these hedges involve an inherent basis risk, a risk that the rate being hedged may move differently

from the rate underlying the hedging derivative, thereby resulting in *hedge ineffectiveness*. The problem with hedge ineffectiveness is that, if it occurs either often enough or substantially enough, hedge accounting could be interrupted or potentially disallowed.

If hedge accounting treatment is desired from the start of the hedge, the intended hedge relationships would have to be documented on or before the derivative contract is entered into; and, among other things, this documentation would have to address the considerations mentioned in the previous paragraph. For most banking institutions, though, a finite set of hedging strategies would be pursued; and thus a finite set of hedge documentation write-ups would be required — one for each hedging strategy employed. Preparing this documentation for each strategy is not trivial, but it is only hard the first time. Thereafter, the same template will apply whenever that strategy is repeated.

Summary. Few banks hold the kinds of portfolios where hedges can be designed to deliver the kind of precision in their outcomes that we might like, whereby we can expect to realize some anticipated net interest margin objective within a matter of basis points. More likely, hedgers have to accept a greater tolerance of uncertainty in connection with their hedging efforts. Clearly, to the extent that expected and realized net interest margins differ, the bank will report some unintended income volatility. This outcome is virtually unavoidable, but the magnitude of this difference likely pales in comparison to the outcomes with hedging versus without. The true benefit of the hedging process is that it fundamentally transforms the risk character of the hedging institution, even if the outcomes are somewhat unpredictable. The fact is, the degree of unpredictability for a hedged portfolio will be sharply reduced relative to that of an unhedged portfolio. That is the big picture that should drive the determination to hedge.

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