Interest Rate Risk: What's a Bank to Do?

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In today's competitive environment, banks and regulators alike must become more familiar with ways to measure and control interest rate risk, despite the complexities involved. Fluctuations in interest rates can either raise or lower the net worth of a financial institution when its assets and liabilities do not respond in the same direction or by equal amounts. True, gains and losses may tend to average out over time if interest rates move in both directions over the long term; nevertheless, the short-term losses from even temporary adverse conditions can be very costly. For example, the rise in interest rates in the early 1980s was a leading cause of losses in the savings and loan industry.

To do anything about interest rate risk, a bank must first measure how much it has. Unfortunately, traditional measures of such risk, while convenient, provide only rough approximations at best. Analysts have known better measures for years, but banks have been slow to adopt them because of their complexity and data requirements. Similarly, regulators to date have sometimes appeared ambivalent about encouraging banks in this direction.

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Once it has adopted a reliable measure of interest rate risk, a bank must choose how to respond. Techniques now exist for hedging against interest rate movements, but those same techniques can just as easily be used for speculative purposes. Moreover, hedging involves direct costs, as well as the forgone profits that an unhedged bank would have earned had it gambled correctly on a change in rates. Gone are the days, however, when a bank can safely ignore the issue.

Recent losses and the current economic environment strongly suggest that many banks are exposed to more risk than is desirable and that at least some degree of hedging is essential. Interest rates have fluctuated much more over the past decade than in earlier periods, implying larger potential losses for an unhedged portfolio. Moreover, even though interest rates are currently lower than in the early 1980s, banks' operating margins tend to be thinner and more variable—and hence more vulnerable to losses due to interest rate risk—because financial markets are more competitive.

The "right" theory for the problem was advanced at least as far back as 1938.

MEASURING INTEREST RATE RISK

The traditional measure of interest rate risk is the maturity gap between assets and liabilities, which is based on the repricing interval of each component of the balance sheet—that is, the period of time over which the interest rate is required by contract to remain fixed. The repricing interval of a fixed-rate account equals its maturity. For adjustable-rate assets or liabilities, the repricing interval is given by the date of the next adjustment.

To compute the maturity gap, an analyst would first group assets and liabilities according to their repricing intervals, such as less than three months, three months to one year, and so on. Within each category, the gap is then expressed as the dollar amount of assets minus liabilities. This approach, however, offers no single summary statistic that expresses the bank's interest rate risk.

Traditionally, depository institutions have had longer average maturities on the asset side than on the liability side. For example, smaller banks and thrifts, especially, often use deposit liabilities payable on demand to fund long-term assets such as fixed-rate mortgage loans. Such banks would have a large negative maturity gap in the shorter-maturity brackets (short-term liabilities exceed short-term assets) and a large positive gap in the longer-maturity brackets (long-term assets exceed long-term liabilities). In this situation, a rise in interest rates would lead to a higher cost of funds before loan rates could adjust, narrowing the bank's interest rate spread and lowering its profits.

Even though the maturity gap can suggest how a bank's condition will respond to a given change in interest rates, it omits certain important factors, including cash flow, unequal interest rates on assets and liabilities, and initial net worth. It is therefore more appropriate to view the maturity gap as an indicator of a bank's liquidity risk, not its interest rate risk: in the event of massive withdrawals of deposits, the rate of withdrawal is limited by the maturity of the deposit accounts; likewise, the rate at which assets can be liquidated to meet the withdrawals is limited by the maturity of loans and other assets. Liquidity risk is important and plays a valid role in maturity-gap management. However, we need a better measure of interest rate risk.

A Conceptual Alternative. The "right" theory for the problem was advanced at least as far back as 1938, when Frederick Macaulay formulated the concept of *duration*. Duration is usually presented as an account's weighted average time to repricing, where the weights are discounted components of cash flow. Originally, however, the technique was devised to determine what percentage change in present value would result from a 1 percent change in the interest rate.[1] In its simplest form, duration provides the correct answer to this question only under special conditions. The most restrictive conditions are that interest rate movements be small and that long-term interest rates be equal to short-term rates at all times. (See *A Simple Example of Duration Analysis*, p. 21.)

A bank is perfectly hedged against interest rate risk when the duration of its assets, *weighted by dollars of assets*, equals the duration of its liabilities, *weighted by dollars of liabilities*.[2] The difference between these two weighted durations is called the duration gap, distinct from the maturity gap discussed above. The larger the duration gap, the more sensitive the bank's net worth will be to a given change in interest rates.

The key element distinguishing duration from maturity is the cash flow, in terms of both its timing and its amount. For a zero-coupon bond or a so-called "bullet" loan, the only payment comes at maturity; in such cases, the duration equals the maturity. However, when interim payments are scheduled, each payment received can be reinvested while each payment owed must be funded. Changes in interest rates that occur before the last payment will affect the value of all remaining payments and hence the net worth of the contract or the portfolio to which it belongs.

Likewise, when loan rates differ from deposit rates (as they must in order for the bank to earn a positive spread), the cash-flow amounts will differ between an asset and an otherwise identical liability. Duration incorporates this distinction, whereas the maturity gap does not.

In addition, the initial net worth also affects an organization's sensitivity to interest rate changes. When assets do not initially equal liabilities, then net worth can change with interest rates even when the duration of assets equals that of liabilities. That is, setting the duration of assets equal to that of liabilities does not by itself necessarily eliminate interest rate risk; these durations need to be weighted by dollars of assets and liabilities to achieve that goal.

Why have these additional factors not been universally incorporated into management and accounting practices more than half a century after their importance was first recognized? There are two reasons, one institutional and the other technical.

Until 1980, not only were interest rates in the U.S. relatively stable, but federal regulations also set the maximum interest rate that banks could pay on deposits. Banks consequently believed they had little reason to worry about interest rate risk. However, the success of

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[1] Many people are surprised to realize that this response factor corresponds to units of time: percent, divided by percent per year, equals years. Excellent introductions to duration theory are provided by Kaufman (1984), French (1988), and, on a more academic plane, Grove (1974). To see that the duration of an asset need not equal its maturity, consider a two-year loan for \$200 at 8 percent repaid in equal installments of \$112.15 each year. The present values of the cash payments are \$103.85 and \$96.15, so the duration of the loan equals (1 x \$103.85 + 2 x \$96.15)/\$200 = 1.48 years. More generally, the formula for duration is $[\Sigma_{t=1}^{T} tP_t/(1 + r_t)^t]/[\Sigma_{t=1}^{T} P_t/(1 + r_t)^t]$, where P_t is the cash flow in period t, r_t is the interest rate in period t (usually assumed in textbooks to be constant across t), and T is the maturity of the loan. The box on p. 21 explains in more detail how duration is calculated.

[2] This implication of duration theory was first derived by Samuelson (1945) and Hicks (1946). The property is strictly true either under simplifying assumptions (if the simple concept of duration is used) or when an appropriate generalization of duration is used, as discussed in Kaufman et al. (1983). The requirement of weighting is discussed later.

money market mutual funds during the 1970s demonstrated that regulatory ceilings on interest rates provided false security to banks, as depositors simply shifted their funds from bank accounts to more lucrative investments. After 1980, the institutional environment shifted as regulatory rate ceilings were phased out just as market interest rates were rising to record levels.

Even though banks now have a stronger motive for measuring and managing interest rate risk than before, several technical factors make it difficult to apply duration analysis correctly. First, the detailed information on cash flows required for duration analysis presents a computational and accounting burden. Second, the true cash-flow patterns are not well known for certain types of accounts, such as demand deposits or passbook savings accounts; they are likely to vary with the size or timing of a change in market interest rates, making it all the harder to quantify the associated interest rate risk. For example, during the 1970s and 1980s, demand deposits continued to pay zero interest while nonbank instruments paid increasingly high rates; in response, commercial firms devised new cash-management practices to economize on their demand balances, which led to lower, more volatile demand balances than previously seen. Prepayments similarly complicate the measurement or prediction of cash flows on home mortgages.

And finally, a more complex version of duration is needed to reflect the fact that long-term interest rates do not always equal short-term rates and indeed may move independently of each other. For these reasons, many institutions have thus far chosen either to retain the simpler, but less accurate, maturity gap methods, or to rely on computer scenarios without always acknowledging their linkage to duration. In the latter case, a better understanding of duration can safeguard against misuse of the simulation results.

A Numerical Approach. Some banks simulate the impact of various risk scenarios on their portfolios, asking, for example, "If interest rates rise by 2 percentage points, how much will my net worth fall?" When done properly, this technique essentially replicates the same bottom line as duration theory while bypassing the more sophisticated mathematical derivations. Indeed, a computer simulation can be made to yield a single summary statistic representing the bank's interest rate risk, which will then equal its duration gap. A useful way of thinking about both the level of risk and how to hedge it, this technique may be thought of as "brute force" duration analysis. (The box at right gives a simple example.) However, drawbacks remain.

The major complication is, again, the need for detailed cash-flow data for assets and liabilities. When loans are repaid monthly and interest payments accrue daily, for example, correct calculations are more difficult than in the simple example shown in the box. A computer scenario is only as useful as it is realistic, and either oversimplifying the cash flows or omitting them from the model entirely can lead to nasty surprises. As it happens, the inclusion of cash flows is an unavoidable complexity—a cost of doing business in today's market environment. One possible response to this cost is to simplify contractual payment schedules according to the trade-off between the benefits of such simplification (easier calculation of portfolio effects) and the costs (lumpier cash flows and other inconveniences).

Likewise, computers alone cannot solve the problem of forecasting cash-flow patterns for some assets and liabilities. Simulations often rely on historical data to estimate the duration of savings accounts, mortgages, and other types of accounts. This backward-looking approach may give good estimates of cash flow under the historical pattern of interest rates, but possibly not if the pattern changes in the future; for that, a more theoretical approach may provide a better forecast. Techniques to address these

A Simple Example of Duration Analysis

To keep calculations as simple and clear as possible, let's look at a balance sheet in which a single-payment two-year loan of $100 is funded by two successive one-year $100 certificates of deposit. (Note that this assumes no initial equity or reserves.) We want to do two things: calculate the duration gap for this portfolio and examine the effect of changing interest rates on the present value of profits (which defines the market value of the portfolio).

Suppose initially that the interest rate is 6 percent for both the loan and the CD. (This means that the bank earns zero spread and, consequently, no profit—not a realistic scenario, but one easy to follow.) At the end of the first year, the bank pays $106 on the first CD and takes in $100 for the second CD for a net cash flow of -$6. In two years it pays out $106 more. The loan is a "bullet loan," requiring no repayment until it matures. At that time the entire loan, plus interest for two years at 6 percent, will be repaid: $100 x 1.06 x 1.06 = $112.36. So the bank's cash flows, both undiscounted and discounted at a 6 percent annual rate, can be summarized as follows:

Year	Income	(Discounted)	Expense	(Discounted)	Profit	(Discounted)
1	0	(0)	$6.00	($5.66)	-$6.00	(-$5.66)
2	$112.36	($100.00)	$106.00	($94.34)	$6.36	($5.66)
Total		($100.00)		($100.00)		(0)

The net present value of the portfolio is zero.

Duration for each side of the balance sheet is calculated as the weighted average time to repricing, where the weight in each period up to repricing is the discounted cash flow as a proportion of total present value. Since the loan has only a single payment coming at the end, the duration of assets is 1 year x ($0 / $100) + 2 years x ($100 / $100) = 2 years, the same as its maturity. Likewise, each CD has one payment coming at its maturity, so the duration of the liability side is 1 year x ($100 / $100) = 1 year.

The duration gap for the entire portfolio is the *difference* between the asset duration, weighted by the present value of assets, and the liability duration, weighted by the present value of liabilities: $100 x 2 years - $100 x 1 year = 100 dollar-years. By comparison, the maturity gap is -$100 in the zero-to-one-year range and $100 in the one-to-two-year range, as seen from the outset.

Like that of the typical small bank, this portfolio has a positive duration gap. Consequently, duration theory tells us that an increase in interest rates will *lower* the present value of the portfolio. We can demonstrate this directly. Suppose there is an immediate, unanticipated increase in the market interest rate to 8 percent. Both the loan and the deposit are locked into the original 6 percent rate for the first year. But in the second year, the deposit rate adjusts to 8 percent while the loan rate is still fixed at 6 percent. Discounting at the new market rate of 8 percent, the cash flows become:

Year	Income	(Discounted)	Expense	(Discounted)	Profit	(Discounted)
1	0	(0)	$6.00	($5.56)	-$6.00	(-$5.56)
2	$112.36	($96.33)	$108.00	($92.59)	$4.36	($3.74)
Total		($96.33)		($98.15)		(-$1.82)

The net present value of the portfolio declines from zero to -$1.82.

We can compare this drop in present value with that predicted by duration theory. As discussed by George Kaufman (1984), the change in the present value of the portfolio equals the negative of the duration gap, times the change in interest rates, divided by the original discount factor. In our example, this equals -100 x .02 / 1.06^2 = -$1.78, very close to the change of -$1.82 computed directly.

thorny questions have been under development for several years now. For example, several computer programs designed to model mortgage prepayments as interest rates change are now commercially available, and even better answers can be expected in the future.

Choosing appropriate interest rate scenarios within which to explore portfolio effects remains more art than science. It is not enough to project a given rise or fall in rates across the board; the term structure may shift, with long rates changing either more or less than short rates, and each variation can have a different impact on overall net worth. The computer cannot tell an analyst how to do this. But even so, the computer-based scenario method can prove more flexible and require less effort than the strictly theoretical duration approach.

CONTROLLING INTEREST RATE RISK

Once a bank has measured its interest rate risk, what action should it take? Some theories of banking consider it essential that banks accept some degree of interest rate risk, and most bankers prefer not to hedge completely against such risk. However, for a bank to profit consistently from changes in interest rates requires the ability to forecast interest rates better than the rest of the market. Obviously, not everyone can be better than average all the time.

The experience of the 1980s suggests that more hedging would be an improvement for the banking industry, even if a complete hedge is not best. There are several ways of bringing a bank's duration gap near zero to construct a hedge. The various approaches generally involve some combination of adjusting the portfolio of assets and liabilities or using nontraditional financial instruments.

Adjusting the Portfolio. Possibly the simplest, most conventional solution is to adjust the maturity, repricing, and *payment schedules* of assets and liabilities. In its simplest form, this approach does not require exotic instruments or strategies; in fact, many banks already use it in a general way.

Consider the example of a small bank or thrift with long-term fixed-rate mortgages funded by short-term CDs. The bank may shorten its asset duration to reduce interest rate risk by holding adjustable-rate mortgages (ARMs) instead of fixed-rate ones, thereby changing the repricing interval of assets. A drawback here is that the demand for ARMs may be substantially weaker in some markets than that for fixed-rate mortgages. Accordingly, a bank may not be able to go as far with this strategy as it would like, and it may also have to accept a lower expected return or spread. A second drawback is that an ARM's cash-flow pattern itself may change following large movements in interest rates: if rates fall sharply, ARMs are frequently refinanced using fixed-rate mortgages; and if interest rates rise very much, ARMs may suffer a higher default rate. These changes in the cash-flow pattern would need to be modeled in order to choose the right amount of ARMs to provide the desired degree of hedging against interest rate risk. A third drawback is that most ARMs are sold with a cap on interest rates, leaving the bank exposed to risk if market rates rise above the cap.

Other actions that a bank can take to shorten its average asset duration include holding short-term securities and lending overnight—for example, in the interbank market. Moreover, early amortization by means of accelerated or fixed-amortization payment schedules can reduce the duration of loans.

Another element of portfolio adjustment involves matching the amounts of assets and liabilities within each duration category. For example, suppose a bank found that its savings accounts behave like a long-duration deposit, even though in principle depositors are free to withdraw at any time. Armed with this information, the bank could then try to match the amount of its savings deposits with the amount of its fixed-rate mortgages, relying on short-duration CDs and other deposits to fund any short-duration assets. In this way the overall weighted duration of liabilities can be brought close to that of the bank's assets, resulting in a hedged balance sheet.

As the example suggests, duration matching is often applied to the balance sheet on an item-by-item basis, where it can provide only an imprecise hedge. More exact hedging is possible if the approach is applied instead to the portfolio as a whole, taking advantage of the fact that a balance between durations of weighted assets and weighted liabilities does not require a perfect match between any subset of the assets and liabilities.

Banks have increasingly turned to asset-backed securities, futures, options, and swaps.

However, a portfolio that is perfectly matched ("immunized") at one set of interest rates will typically require rebalancing as soon as rates move. Such rebalancing can involve transactions costs, as well as more complicated calculations if individual components of the balance sheet are not matched. In addition, at some point greater precision in hedging may require more exotic instruments or techniques.

Using Nontraditional Financial Instruments. Within the past decade, banks have increasingly turned to such hedging instruments as asset-backed securities, futures, options, and swaps.[3] Their adoption has been concentrated among the large banks, however, and has tended to meet with suspicion from small bankers (who view them as a costly and unnecessary complication) and even from regulators (who view them as another means by which banks can take on more risk).

There is some truth in all these views. A wider range of instruments requires more resources to manage, but these instruments, if managed well, can save resources in the long run. And indeed, additional instruments can be used either to reduce or to increase overall portfolio risk, according to the intention and expertise of a bank's management and staff. Examiners would need special training to distinguish good from bad. But as with fire, informed use beats uninformed neglect.

Securitization. Traditionally, bankers have viewed the activities of originating and holding a loan as inseparable. More recently, however, they have recognized that the activities are truly distinct, such that the originating institution may differ from the institution that holds the asset to maturity. A bank may originate a loan, shortly thereafter sell the loan for a fee to a third party, and subsequently repeat the process.

When a loan is sold, it may be marketed alone or as part of a package of loans. A common approach is to bundle a number of similar loans, such as auto loans, credit-card loans, or home mortgages, and sell the package at a specified yield—a process called "securitization," since it converts loans into a contractual stream of payments resembling a bond or some other security. The similarity of loans within a bundle makes assessing its risk easier, while the multiplicity of loans allows some diversification of default risk.

Although fee income from the sale has drawn attention as a motivation for this activity, an equally important aspect is that the loan's effective maturity *to the bank* is only the interval between origination and sale. Therefore, securitization may substantially reduce the bank's average asset duration and, in the case

[3]A number of these instruments are described by Grumball (1987).

of a typical small bank with long-term mortgages and short-term deposits, reduce its interest rate risk.

The success of this method requires, among other things, a demand for the securitized asset. If interest rates rise, a loan with a fixed rate suddenly below market is no longer an attractive purchase. It could be sold only at a discount, forcing the originating bank to realize an immediate loss.

Recent evidence also suggests that combining traditional banking with securitizing may tend to raise a bank's costs.[4] This result could be viewed as reflecting a cost of managing interest rate risk: you don't get something for nothing. Subject to these limitations, securitization offers an attractive opportunity for banks to shorten their asset duration.[5] Of course, misuse is possible. Banks can buy as well as sell securitized assets, and a bank that buys a package of securitized loans may lengthen its asset duration, increasing its interest rate risk. For this reason a bank should make sure that it ends up on the right side of a deal for its own portfolio needs; indeed, some banks have suffered losses by neglecting this principle.

Swaps. A swap is a contract that trades payment streams (but not the underlying principal or associated credit risk) between two parties. For example, a bank having a fixed-rate mortgage with 10 years remaining to maturity may prefer to receive a variable-rate payment stream in order to shorten its asset duration and reduce its interest rate risk. Suppose it finds another institution that has made a variable-rate commercial loan of equivalent principal amount with 10 years left to maturity. If that institution would prefer to receive fixed-rate payments, the bank can contract to pass through its mortgage payments to the second institution in return for receiving a pass-through of the variable-rate commercial loan payments. The mortgage itself remains on the bank's books, while the commercial loan stays on the books of the second institution. Such a contract is known as a swap.

Interest rate swaps can reduce interest rate risk either by converting a fixed-rate income stream to a variable-rate stream, as in the example, or by converting a variable-rate expense stream to a fixed-rate stream. Used in the first way, a swap shortens the duration of assets; used in the second way, it increases the duration of liabilities. Either or both approaches can help overcome the typical bank's mismatch between long-duration assets and short-duration liabilities.[6]

The arrangement has several shortcomings, however. First, if the commercial borrower defaults, then the variable-rate income stream stops and the bank must turn elsewhere if it desires to continue trading fixed-rate for floating-rate payments. By that time, interest rates may have changed, making it difficult for the bank to find another counterparty at the original terms. This possibility shows that the hedge is not perfect.

Second, the arrangement seemingly requires the bank to find an institution with repricing needs exactly opposite its own. However, approximate matches can be accommodated by more complicated contracts involving more than two assets or parties. A related problem is that if all banks want to be on the same side of the deal, there may not be enough counterparties willing to take the other side.

[4]See Mester (1990).

[5]See Nadler (1987) for an argument that even community banks can benefit from securitization.

[6]Even community banks can benefit from this seemingly intricate arrangement; see Findlay (1987).

Futures. An interest rate futures contract is an agreement between two parties to buy (or sell) a fixed-income asset, such as a Treasury security, for a fixed price at a specified date. The holder of such a contract earns a positive or negative profit based on the difference between the specified delivery price and the price at which the underlying securities can be sold after taking delivery.[7]

Unlike securitization and swaps, which alter the repricing intervals of a bank's assets and liabilities, futures can be used to create cash flows that offset losses on the original portfolio. For example, a bank that would lose net worth if interest rates rise can reduce this risk by *selling* bond futures, locking in the current interest rate and, in effect, selling bonds short.[8] If interest rates rise before the futures contracts expire, bond prices will fall and the bank can close out its futures position at a profit by buying either the bonds or additional futures at a lower price. The profits on the futures offset losses due to declining interest rate spreads on the rest of the portfolio. If interest rates fall, losses on the futures are offset by increased interest rate spreads on the rest of the portfolio. However, it should be emphasized that futures, like any hedging device, cannot totally eliminate all risk; some sources of residual risk remain even after careful application of futures.[9]

Although any interest-rate futures contract can provide a hedge against interest rate risk, futures on U.S. Treasury instruments have special advantages: (1) there is negligible risk of default on the underlying instruments; (2) the relevant markets are highly liquid; and (3) the yields move more in line with market interest rates than with factors unique to the instrument, making them ideal for hedging diversified portfolios.[10]

WHAT NEXT?

Fundamental changes in the regulatory and market environment have made interest rate risk a vital issue. The importance of this risk underlies the explosive growth of banking's involvement in so-called derivative instruments (such as futures and options, which are "derived" from other financial contracts) and in new strategies over the past decade. In the period from 1980 to 1985, the volume of interest rate futures held by banks grew tenfold, as did the volume of loan sales by banks in the period from 1983 to 1988.[11] Interest rate swaps grew from an estimated world market of $3 billion in 1982 to well over $100 billion just three years later and to over $500 billion by 1987; the outstanding amount of pass-through securities backed by residential mortgages reached $769 billion by 1988.[12]

However, even though the aggregate volume has grown dramatically, these new activities have been concentrated in a relatively few

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[7]Morris (1989) provides an excellent introduction to the potential use of interest rate futures by banks, while Koppenhaver (1986) describes the role of options on such futures.

[8]See Green (1986), p. 86.

[9]Morris (1989) discusses several types of residual risk.

[10] For a small, undiversified bank, a futures contract on the sector most heavily represented in its portfolio may also be an effective hedge, not only against interest rate risk but also against price or credit risk, if the futures market is liquid and default risk on the contract is low. Examples might be oil futures for Texas banks or commodities futures for agricultural banks.

[11]See Parkinson and Spindt (1985), p. 226, and Boemio and Edwards (1989).

[12]See Bank for International Settlements (1986), pp. 39-43; Smith et al. (1988); and Boemio and Edwards (1989).

large banks. For example, in the second quarter of 1989, nine money-center banks accounted for about 40 percent of total loan sales, and 54 banks accounted for more than 90 percent.[13] Most of the nation's 13,000 banks have remained hesitant about plunging in, some on the premise that the fundamental business of banking hasn't changed and therefore doesn't require new approaches, and others on the premise that the costs of learning and managing the new techniques would outweigh any benefit. Such arguments appear short-sighted in today's combination of thinner margins, aggressive competition, and volatile interest rates.

As more banks perceive the need to reduce their interest rate risk, regulators need to be trained in evaluating the use of the new techniques, since a debate inevitably arises when managers and regulators disagree on an institution's position. A recent dispute occurred in Kansas, where regulators argued that Franklin Savings Association was insolvent even though management (and eventually a federal court) held that it was solvent once its sophisticated hedging techniques were properly recognized.[14] Traditional accounting rules further cloud the issue: when the balance sheet is not marked to market, a gain on the portfolio will not be fully reflected on the books, whereas a corresponding loss on the hedge may have to be recorded. However, the Financial Accounting Standards Board allows a loss on futures or other hedging programs to be kept off the books if it "correlates with and offsets" an unbooked capital gain.[15]

To avoid such uncertainty and waste, regulatory guidelines must keep pace with the industry. The Basle accord on banks' risk-based capital requirements recognized this need by incorporating a commitment to augment guidelines over the next few years to account for interest rate risk. This resolve was reiterated in a recent Treasury Department proposal to reform the financial system.[16]

The only alternative would be to ban modern hedging techniques, a move that would have at least two unfortunate consequences. First, it would leave the burden of interest rate risk on the banks and the already strained federal safety net. Second, it would place U.S. banks at a further competitive disadvantage relative not only to major players from other nations, but also to other U.S. financial institutions.

In summary, we can't turn back the clock now. Regulators and banks alike need to become more familiar with measures of interest rate risk and the ways of hedging it.

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[13]See Mester (1990), p. 5.

[14]See Labaton (1990) and Milligan (1991).

[15]See Milligan (1991), pp. 54-55.

[16]See U.S. Department of the Treasury (1991).

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