

Managing Market Value Risks: Miscellaneous Strategies

Offsetting Option Risks: Callable Advances vs Mortgages

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We're baaaack! Tom & Tom are once again arguing about the asset / liability management issues that are challenging your management team. You've run across many of these issues several times over the past several economic cycles. However, since markets have become more complex and competitive, your solutions must be more sophisticated in design and implementation.

One such solution involves the use of the callable FHLB advance to attack the problem of excessive market value risk. That's right! We're talking about correcting a problem that's been caused by the option risk embedded in a mortgage portfolio by adding the option risk contained in a callable advance.

At the outset of this article, let me go on the record in saying that I don't like giving up current real income that is real dollars of capital, to fix a perceived problem with the market value of portfolio equity. But these are the regulatory cards that we've been dealt, and we'll play the hand.

Besides it gives me the opportunity to discuss how a counterintuitive solution can be used to solve a potential problem with the present value of future income??!! Hey, Alice, are we in Wonderland yet?

Mortgages Create Asymmetrical Market Value Risk

Tom F. has already introduced you to our case study institution, Miss Fed. It's a bank with tons of mortgages and MBS's and all of the optionality that goes with them. Many of you have first-hand experience with the consumer option attached to mortgages. When rates go up, the cash flows off mortgages slow down. When rates go down, mortgage cash flows accelerate and refinance into lower yielding assets. The result is a mortgage asset whose price fails to rise as fast in a falling rate environment (less cash flows to appreciate in value) than its price will decline in a rising rate environment (more cash flows to depreciate in value). This pricing performance is the genesis of the statement, "more pain than gain in a mortgage portfolio." And, for the more technically oriented among you, this pricing performance is also described as "negative convexity."

Now, I know that this "mortgage-packed" balance sheet and its characteristic "liability-sensitive" policy-busting degree of interest-rate risk seems really extreme to most of you. Regulators who see this are tempted to say: "I told you so." See, see the trouble you can get into with fixed-rate mortgages. Some managers are thinking, "See, Parliment, you nagged me to use my capital to attack the retail markets with whatever product the consumer would purchase, even long-term mortgages, and look at the problems it can create."

I say to you all – “Whatever.” Look I wasn’t around when Miss Fed developed its balance sheet. There may have been a better way to leverage their excess capital. In any event, “woulda, shoulda, coulda” reasoning doesn’t help their current dilemma. My partner, Tom Farin, proposed one solution, and I proposed a better one. That’s what I want to discuss.

The Abominable Base Case

Miss Fed finds itself with volatility of net income and portfolio equity that is displayed in the accompanying tables and charts.

The base case shows the regulatory “red flag” triggered as Miss Fed’s market value of portfolio equity (MVPE) drops by 385 basis points from 9.44% to 5.59% as evaluated with an immediate and permanent shock to interest rates of 200 basis points. This drop of 385 basis points represents a drop of 43%, 13% greater than the board of director’s policy limit of 30%. And, perhaps more importantly, the resulting post-shock level of MVPE drops below the regulatory minimum of 6%.

For those of you not familiar with the specific regulatory measurements of the Office of Thrift Supervision, it’s ok. What matters is that Miss Fed funded \$90 million in 30 year fixed-rate mortgages, yielding an average return of 7.63%, with \$90 million in overnight advances costing 5.74 % as of February 2000. Oh, there are some other longer term advances on the books, but they have their work cut out for them funding longer term MBSs. Not surprisingly, their one-year forecasted net income also shows the impact of a 200 basis point shock in interest rates, dropping by almost \$2 million from \$4.684 million to \$2.762 million.

As discussed in the presentation of the Miss Fed case, we only have a very short time to get the institution back into regulatory compliance, that is, a post-shock MVPE of at least 6% along with an equity exposure of less than -30%. We need a short-time solution.

Tom’s Matched Funding Solution

Tom Farin freaks.

Tom, after carefully considering the cease and desist order, freaks. He suggests borrowing \$30 million in 30 year amortizing advances with a 5-year prepayment option at a cost of 7.77%! (Remember that the mortgages he is hedging are only earning 7.63%.) He’s going to have to pay-up for long-term funding to reduce the market value risk. He bought just the amount of advances that he needed to bring Miss Fed back into regulatory compliance. It costs the institution \$630,000 to get the post-shock MVPE ratio up to 6.48%, and the equity exposure reduced to .35%.

What is really amazing is that Tom's solution ends up earning less income in all of the rate shocked environments: \$630 thousand less in the flat rate scenario, \$54 thousand less in the rising rate scenario, and \$1.112 million less in the falling rate scenario. Jeez Louise, Tom that's one hell of an insurance policy!

Now, in all fairness, this short-time solution is only the beginning for Tom. He goes on to suggest a longer-term fix involving a fundamental change in asset structure. But that is not our point in this article. Tom's costly short-time solution is *not* our point. You have to understand that while Tom was casting about for ideas to help with Miss Fed's plight, I, his trusty sidekick, was humbly suggesting that maybe, just maybe he should consider callable advances as one of his funding solutions.

Funding Shorter Than Short

You see, I, for one, have always been intrigued at how these monster mega-banks have been able to fund themselves shorter than Fed Funds, dropping their funding costs below Fed Funds for a fixed term of three to six months and even up to one year. They can get these deals because they are willing to accept the risk that they could be *stuck* with these funds at this fixed rate for up to ten years. Of course, after a specified call period, if rates rise, these funds can be called away, leaving the bank subject to the risk of continuing to fund in the rising short-term funds market.

The Federal Home Loan Banks, in an effort to extend the advantages of the capital markets to their members, developed a structure called the callable advance.

For instance, the 10/1 advance typically would give an institution a borrowing cost for one year at sub-LIBOR rates, say 4.6%. But at the end of that year, and at subsequent periodic intervals, the FHLB could call the funds or, in effect, the advance would revert to the overnight rate. The borrower, of course, would retain the right to pay off the advance on any of the subsequent call dates. In the event that rates went down, however, the borrower could be *stuck* with the advance at the rate of 4.6% for as long as ten years.

I often commented to Tom, *Golly gee, how bad could that be, that I be stuck with money for ten years at 4.6%?* Whereupon, he would lose patience with me and say, *Come on Parliament, if rates go down, you have a long duration, underwater liability and if rates go up, you have no protection from those rising rates. That's called option risk. big time,* he would scold me. *Furthermore,* he would remind me, *regulators are frowning on the use of such advances by institutions not sophisticated enough to model the option risk associated with the instrument.*

Well, you can just imagine, after being soundly chastised for having unclean thoughts, I silently slunk away to sulk. Of course there are those of you wondering why I didn't just model my own

idea and demonstrate its superior performance. But that would have taken work. And, besides Miss Fed was Farin's client, not mine.

Dr. Tom's 'Add More Optionality' Solution

Eventually, young master Tom found himself in an educational situation where he wanted to demonstrate the folly of Dr. Tom's solution to the Miss Fed dilemma using the callable advance. So he modeled a scenario in which he booked \$75 million in 10/5 callable advances at a rate of 6.46%, essentially replacing all but \$18 million of the overnight funding. Now this may not have been the best deal on callable advances at the time, but it did lock in funding at a rate of 6.46% for at least five years. This was a rate fully 54 basis points below the 7.25% cost of the 5 year bullet advance and a considerable 131 basis points below the cost of his 30 year amortizing advance with the 5 year prepay option. Of course, the lower initial rate on the 10/5 callable advance was to be paid for by the option to be stuck with the 6.46% rate for as long as 10 years should rates fall.

Et voila! The results speak for themselves. Dr. Tom's add more optionality solution did a better job returning Miss Fed to the regulatory reservation at less of a sacrifice in income. Ahhh! That's performance. Let's look at some of these results.

Instead of sacrificing \$670,000 in income from the base case, Dr. Tom's solution costs \$304,000. And for this premium, the post-shock MVPE is 6.70%, .22% greater than the 6.48% MVPE produced with the greater insurance premium. And, in fact, the post-shock result of Dr. Tom's solution even results in greater income than in the base case (\$3.241 million compared to \$2.726 million). That's the way insurance plans are supposed to work.

Of course, the increased optionality of Dr. Tom's solution is clearly shown by the fact that in a falling rate scenario, more of both income and MVPE is sacrificed. Income drops by \$1.343 million as opposed to \$1.112 million in the falling rate scenario. MVPE rises to 10.62% instead of rising to 10.86%. But that is just the point of the increased optionality. Miss Fed has made the sacrifice under the scenario where it can better afford it.

Food For Thought

Let me re-emphasize that these funding solutions are in no way being offered as optimal strategies for Miss Fed or any other institution. Miss Fed found itself in quite a briar patch. We were just trying to find a short-term solution to a situation that clearly needed some strategic overhaul.

What we discovered while we were scrambling to keep the institution in compliance was pretty interesting. A solution involving adding another layer of optionality to the balance sheet proved

viable. Many managers might see this solution as counterintuitive. There was no way to be certain without doing the actual simulation and testing of income and market value sensitivity.

Base Case	Book	-200	0	+200
Portfolio Equity Ratio	9.30%	11.87%	9.44%	5.59%
Net Income		\$5,011	\$4,684	\$2,726
Rate Sensitivity (Basis Points)		243		-385
Equity Exposure (% change)		30.00%		-43.00%
Equity Exposure (Board Limits)		-30.00%		-30.00%
Equity Exposure (Variance)		60.00%		-13.00%
Regulatory Equity (Minimum)		6.00%		6.00%
Regulatory Equity (Variance)		5.87%		-0.41%

Tom's Matched Funding Sol'n	Book	-200	0	+200
Portfolio Equity Ratio	9.30%	10.86%	9.49%	6.48%
Net Income		\$3,899	\$4,054	\$2,672
Rate Sensitivity (Basis Points)		137		-301
Equity Exposure (% change)		18.00%		-0.35%
Equity Exposure (Board Limits)		-30.00%		-30.00%
Equity Exposure (Variance)		48.00%		-5.00%
Regulatory Equity (Minimum)		6.00%		6.00%
Regulatory Equity (Variance)		4.86%		0.48%

Dr. Tom's Add More Optionality Sol'n	Book	-200	0	+200
Portfolio Equity Ratio	9.30%	10.62%	9.64%	6.70%
Net Income		\$3,668	\$4,360	\$3,241
Rate Sensitivity (Basis Points)		98		-294
Equity Exposure (% change)		13.00%		-33.00%
Equity Exposure (Board Limits)		-30.00%		-30.00%
Equity Exposure (Variance)		43.00%		-3.00%
Regulatory Equity (Minimum)		6.00%		6.00%
Regulatory Equity (Variance)		4.62%		0.70%

Figure 2

Income Break-out

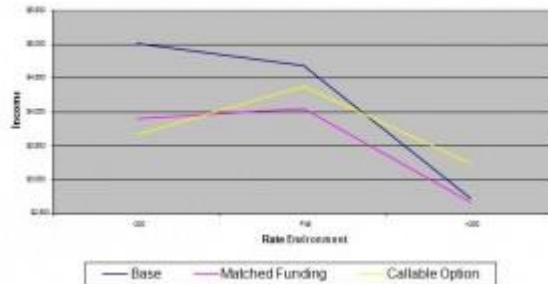


Figure 3

Market Value of Equity

