Leverage strategies:
Is now the right time?

Two examples demonstrate potential upside of leverage strategy, if your bank can stand the increase posed in interest rate risk

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Many well-capitalized community banks are flush with liquidity as the U.S. economy works through the ongoing recession. This group includes banks that received funds under the Troubled Asset Relief Program (TARP) who do not need the proceeds to replace capital charged-off from problem assets. With the prime rate at 3.25%, high-quality commercial loans yield less than what a bank can earn on certain types of government securities with no credit risk. A critical dilemma facing management is thus how to best invest the funds.

One popular recommendation is for banks to pursue leverage strategies.

While some analysts criticize these strategies, labeling them too speculative, all investments embody some risk. The important question is whether management understands the risk versus return trade-off and whether the bank is well positioned to manage the risk.

This paper describes typical leverage trades in order to demonstrate the issues that should be considered when evaluating whether such trades are appropriate for the bank. It documents the profit potential; the ability to alter a bank's overall interest-rate-risk profile; and the specific risks assumed from such trades.

Readers will then be better able to assess whether and how such trades might fit in their bank's portfolio strategy.

Recent leverage strategies

For years speculators have tried to profit by borrowing at low rates, investing at higher rates, and occasionally trying to hedge against adverse rate changes.

The yen carry trade has long been one of the most popular examples, because the Bank of Japan has kept Japanese interest rates relatively low. Low rates induced speculators to borrow in yen and invest in higher yielding assets denominated in other currencies. As

long as their borrowing rate stayed below the investment yield, speculators profited. The obvious risk is that the yen might appreciate relative to other currencies such that the yen-denominated debt would have to be repaid with less-valuable currency. Speculators have generally done well with this trade as the yen has not appreciated sufficiently.

Taking advantage of the difference between short-term and long-term rates was also the strategy behind large banks' use of structured investment vehicles (SIVs). Institutions originated loans and transferred them to SIVs, where they presumably shifted the credit risk to SIV equity investors. SIVs were off-balance sheet vehicles that held the loans, often risky mortgages and collateralized debt obligations (CDOs), which had longer maturities financed largely by short-term commercial paper. The interest rate spread was expected to be large enough to pay fees to the originator and other parties; pay interest to the commercial paper investors; and generate acceptable returns to the SIV equity holders. The magnitude of potential profits was typically magnified by leveraging the equity 20 to 30 times.

Risks and rewards of leverage strategies

There are two sides to the leverage strategy, the potential risk, and the potential gain.

There are three substantive risks in any carry trade.

First, the assets may default and/or may be illiquid.

Second, the borrowing rates might rise, thereby lowering the spread below that necessary to pay fees and provide a positive return to equity holders.

Finally, investors in the funding instruments might refuse to roll-over their investments, creating a liquidity crisis.

Citigroup's experience was that some of its SIVs' assets went into default, while others were viewed as illiquid because they were difficult to value. Commercial paper investors subsequently refused to roll-over their investments, such that Citigroup was forced to extend credit to the SIVs to pay off commercial paper holders. Ultimately, Citigroup moved the assets back onto the firm's balance sheet after which it wrote-down their value.

When conditions are favorable, the carry trade can generate significant profits, especially when it is highly leveraged. Of course, it also carries risks that are often overlooked at initiation of the trades. In today's recessionary environment, with rising nonperforming loans and loan charge-offs, many banks have slowed loan growth. Borrower quality is less certain and loan yields may not adequately compensate lenders for the inherent credit risks. Thus, many banks with sufficient capital and liquidity are again considering leverage strategies with bonds in the search for profits. These strategies may be attractive, especially if the associated interest rate risk is balanced by existing exposures.

Leverage strategies with fixed-income securities are comparable to the carry trades described previously. The purpose of this article is to examine two specific leverage trades in order to document the profit potential; demonstrate the opportunity to alter a bank's overall interest rate risk profile; and explain the specific risks assumed.

Readers will then be better able to assess whether and how such trades might fit in their bank's portfolio strategy.

Basic yield curve leverage strategy

Leverage strategies with fixed-income securities are most attractive when the yield curve exhibits its normal positive slope. The greater the difference between long-term and short-term rates, the greater is the potential profit from borrowing short and investing in longer-term instruments.

Since June 2006 the Federal Reserve has lowered the target federal funds rate from 5.25% to a range from 0 to 0.25%. Because long-term rates have not fallen coincidentally, the yield curve now provides opportunities to capture significant spreads. For example, the spread between 10-year Treasuries and 2-year Treasuries was 1.91% on February 3, 2009. The same spread for 20-year versus 2-year Treasuries was 2.45%. This compares to spreads of -0.01% and 0.15%, respectively, in late June 2006.

Recently, long-term rates on debt obligations of government-sponsored enterprises (GSEs), such as GNMA, have not fallen as much as long-term Treasury rates. Hence, the basic yield curve strategy is to borrow short-term and buy longer-term GNMAs.

Still, there are clear risks to this strategy.

Given general credit and liquidity concerns, virtually any investment security carries both credit and liquidity risk that is reflected in the promised yield. Similarly, to the extent that the effective maturities or durations of the investment and funding are not matched, reinvestment risk may differ substantially from funding risk.

At maturity of the shorter-term borrowing, banks may find that funds are not available or the borrowing rate has sharply increased. Should management want to exit the trade, it would need to sell the securities to pay off the borrowing. The overall profit would then depend on the carry spread plus the gain or loss on the security. Similarly, a mortgage-backed security may prepay at higher or slower rates than initially anticipated. As such, the amount of outstanding principal at maturity of the funding is not known in advance.

Objectives underlying leverage strategies

Banks choose fixed-income leverage strategies for two general purposes.

First, management may want to reduce an asset-sensitive bank's overall interest-rate-risk exposure.

Asset-sensitive banks are exposed to loss in the form of reduced net interest income when rates fall. A leverage strategy that adds longer-term assets versus liabilities represents a natural hedge as the liabilities reprice with greater frequency. Thus rate declines (increases) will lower (increase) borrowing costs relative to asset yields. If rates increase, the net spread on the leverage trade will fall but the bank's aggregate net interest income from other balance sheet positions should increase.

Second, management may want to generate additional profits from the positive spread on the assets financed with shorter-term debt associated with a normal yield curve and associated risk premiums. In this context, the leverage trade is speculative.

With leverage strategies, banks can choose many different types of borrowing and invest in many different types of securities. We'll examine two alternatives involving GNMA securities with a zero risk weighting for risk-based capital purposes. Thus, credit risk is minimized. We'll use a framework that focuses on changes in net interest income across different interest rate environments to assess the trade-off between profitability and risk. An alternative approach might examine total return by incorporating changes in principal values of the assets.

Importantly, we'll ignore credit and liquidity risks and instead focus on interest rate risk, including changing mortgage prepayments. We conduct shock analysis allowing the prime rate to rise and fall 100 and 200 basis points, respectively, and estimate the effective net interest spread under each scenario.

We'll initially analyze a strategy that uses layered-maturity funding to minimize interest rate risk. The GNMA investments have no credit risk. Banks that choose to pursue this type of leverage strategy must take into account their institutions' capital position and firm-wide sensitivity to interest rate changes. This and other strategies may be more (less) attractive depending on whether the bank has excess (adequate) capital and whether it is asset (liability) sensitive.

Strategy 1: ***Purchase GNMA Securities Funded with a Series of Fixed-Rate Bullet FHLB Advances***

Consider a well-capitalized, asset-sensitive bank with $400 million in assets.

Management expects the bank to earn 10% on equity (ROE) and 0.70% on assets (ROA) during the upcoming year, with a net interest margin of 3.60%. The bank's tier 1 leverage ratio is expected to average 7.5%.

In December 2008, the bank could buy $7.5 million of a GNMA mortgage-backed security with a 6% coupon, maturing in October 2038 priced to yield 5.68%. It could buy another $7.5 million in GNMAs maturing in September 2038 with a 5.8% coupon and priced to yield 5.41%. The bank could fund the purchase with five bullet FHLB advances with sequential maturities one year out, respectively, as noted in Table 1. The associated

borrowing rates range from 2.21% to 3.37% and rise with maturity. The principal amounts increase with maturity totaling the same $15 million invested.

Note that because GNMAs carry a zero risk weighting for capital adequacy purposes, this transaction does not adversely affect the bank's risk-based capital ratios.

Table 1:

Leverage with Layered Bullet FHLB Advances

Assets		Liabilities	
GNMA MBS	$7,500,000	1 YR FHLB Advance	$1,500,000 @ 2.21%
GNMA MBS	$7,500,000	2 YR FHLB Advance	$2,500,000 @ 2.74%
	$15,000,000	3 YR FHLB Advance	$2,000,000 @ 3.10%
		4 YR FHLB Advance	$3,000,000 @ 3.18%
Average Yield = 5.545%		5 YR FHLB Advance	$6,000,000 @ 3.37%
			$15,000,000
			Average Rate = 3.08%

This leverage strategy clearly involves interest rate risk. The mortgage collateral for the GNMAs has a scheduled amortization plus potential prepayments that will increase with falling rates and slow with rising rates. The principal amounts of the FHLB advance funding are chosen to approximate the reduction in principal on the GNMAs over time. Interest income on the GNMAs will, in turn, decrease over time, depending on the magnitude of principal reduction.

On the funding side, the effective rate paid on the five advances will rise over time, as the shorter-term advances mature. The average rate of 3.08% applies only for the first year, when all advances remain outstanding. If rates stay constant and the maturing advance is not even partially replaced after one year, the average cost of financing will rise to 3.17%.

The prepayment option on the underlying mortgages has the following general implications for the overall performance of the transaction:

Falling rates: (1) increase mortgage prepayments and lower reinvestment income such that interest income falls, and
(2) the greater is the decline in rates, the lower is the net spread

Rising rates: (1) decrease mortgage prepayments and raise reinvestment income so that interest income declines by lesser amounts over time, and
(2) the greater is the increase in rates, the greater is the net spread

Table 2, below, presents sample rate shock results.

Data are provided for the outstanding principal on the GNMAs using Bloomberg's prepayment assumptions for each rate scenario and aggregate FHLB funding, as well as the estimated net spread and net dollar earnings. The analysis for net spread and net earnings assumes that when FHLB advances mature, they are replaced with funding at the prevailing advance rate. Cash flows from the GNMAs are reinvested at the initial rate plus or minus the assumed change in rates. Thus, the balance sheet is assumed to be the same size over the shock period. In reality, most banks will use cash flows from the investments to pay off the maturing advances.

Table 2:
Rate Shock Results for 30-Year GNMA Securities
Funded with Layered FHLB Bullet Advances

		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Investment Principal*						
Rates Up	2.0%	$14.19	$12.85	$11.70	$10.62	$9.65
Rates Up	1.0%	13.99	12.27	10.71	9.31	8.02
Rates Flat		13.70	11.48	9.48	7.61	5.93
Rates Down	1.0%	13.08	10.27	8.20	6.45	5.02
Rates Down	2.0%	12.11	8.35	6.45	4.97	3.86
Funding Principal*						
Rates Up	2.0%	$15.00	$13.50	$11.00	$9.00	$6.00
Rates Up	1.0%	15.00	13.50	11.00	9.00	6.00
Rates Flat		15.00	13.50	11.00	9.00	6.00
Rates Down	1.0%	15.00	13.50	11.00	9.00	6.00
Rates Down	2.0%	15.00	13.50	11.00	9.00	6.00
Net Spread**						
Rates Up	2.0%	2.51%	2.46%	2.29%	2.16%	1.89%
Rates Up	1.0%	2.50	2.50	2.43	2.39	2.28
Rates Flat		2.47	2.47	2.47	2.47	2.47
Rates Down	1.0%	2.42	2.36	2.39	2.41	2.51
Rates Down	2.0%	2.32	2.11	2.19	2.26	2.51
Net Earnings**						
Rates Up	2.0%	$376.8	$369.7	$342.8	$324.3	$283.7
Rates Up	1.0%	374.4	374.3	364.8	358.9	341.8
Rates Flat		370.5	370.5	370.5	370.5	370.5
Rates Down	1.0%	363.0	354.4	358.7	361.2	376.9
Rates Down	2.0%	348.0	316.5	328.4	338.8	376.6

* Figures are in millions.
** All figures are pre-tax; figures for net earnings are in thousands.

Consider the shock results for the first year, when the full $15 million is funded for the entire year.

In the base case where interest rates are unchanged (flat) the spread is 2.47%, which produces $370,500 in net earnings.

If rates rise, mortgage prepayments slow, such that interest income is greater than in the base case.

If rates fall, prepayments increase such that interest income and net earnings are lower.

The net spreads and net earnings vary in subsequent years depending on how much mortgage prepayments change relative to the gradual decrease in dollar funding. Generally, the net spread is greatest in the base case with constant interest rates over time. The net spread is lowest when interest rates rise 2%. In this environment, principal reductions on the mortgages slow sharply. Even though reinvestment income rises, the average funding cost rises more, especially 4 and 5 years out, such that the spread falls to an estimated 1.89%. The shock results demonstrate the liability sensitive nature of this position. On average, this leverage transaction will add at least $340,000 in additional income each year according to the shock analysis.

Importantly, the 5-year horizon for the shock analysis masks risk beyond the fifth year. At this time, the FHLB advances will have been repaid, yet a portion of the GNMA principal will remain on the bank's books. Even if rates fell 2% per year, almost $4 million in mortgage principal would remain at the beginning of year 6. With rates 2% higher, the projected principal is $9.7 million such that just over one third of the initial principal would have been repaid. The net spread in year 6 and subsequent years would then depend on how this principal is financed. If rates were substantially higher, the spread would fall and could possibly move negative because the mortgage rates are fixed while funding costs vary. If the net spread were to go negative, any losses could potentially offset the positive incremental earnings during the first five years. If rates were lower, the spread would increase. Given that most banks pursuing this leverage strategy would use cash flows to pay off advances as they mature, they would need to identify specific sources of liquidity to fund the remaining principal at maturity of the advances.

Strategy2: ***Purchase GNMA Securities Funded with a Single Fixed-Rate Bullet FHLB Advance***

In January 2009, the bank could buy $41.5 million in GNMA securities with a 6.5% coupon maturing in 2038, and priced to yield between 5.24% and 5.31% as demonstrated in Table 3. The bank could fund the purchase with a 3-year, fixed-rate bullet FHLB advance paying 2.35%. While the GNMAs again carry no credit risk, there is interest rate risk in this transaction.

In the flat interest rate environment which represents the base case, the weighted average life of the GNMA securities is 4.2 years versus the 3-year liability. Given the amortization schedule and estimated mortgage prepayments, the weighted average duration of the GNMAs is 1.6 years, which is less than the duration of the FHLB advance. The short estimated duration recognizes the high rate of prepayments expected given that current mortgage rates are well below the 6.50% coupon rate on the mortgages underlying the GNMAs. Thus, the transaction exhibits interest rate risk with the impact on net earnings and the bank's economic value of equity dependent on how interest rates

change. With the shorter duration assets, the bank's economic value of equity will increase if rates increase, and will decrease if rates fall.

Table 3:
Leverage with a 3-Year, Fixed-Rate Bullet FHLB Advance

Assets		Liabilities	
GNMA MBS	$5,200,000 @ 5.24%	3 YR FHLB Advance	$41,500,000 @ 2.35%
GNMA MBS	$14,100,000 @ 5.24%		
GNMA MBS	$5,200,000 @ 5.31%		
GNMA MBS	$17,000,000 @ 5.29%		
	$41,500,000		
	Average Yield = 5.27%		

Table 4, below, presents sample rate shock results for net earnings over a 3-year horizon. The analysis again assumes a constant size balance sheet, such that cash flows from the GNMAs are reinvested at the initial rate plus or minus the assumed change in rates.

Table 4:
Rate Shock Results for 30-Year GNMA Securities
Funded with a 3-Year FHLB Bullet Advance

		Yr 1	Yr 2	Yr 3
Net Earnings*				
Rates Up	2.0%	$1.43	$1.65	$1.87
Rates Up	1.0%	1.38	1.52	1.67
Rates Flat		1.25	1.32	1.40
Rates Down	1.0%	0.41	0.66	0.79
Rates Down	2.0%	0.25	0.34	0.39

* All figures are pre-tax; figures are in millions.

Consider the shock results for the first year in the base case where interest rates are unchanged. In this scenario, net earnings equal $1.25 million with a net spread of 3.02%. If rates rise, mortgage prepayments slow such that interest income is greater than in the base case. If rates fall, prepayments increase such that interest income and net earnings are lower.

In all cases, interest expense is constant, given the fixed 3-year maturity on the FHLB advances. The estimated range for net earnings from the transaction given rate shocks of -2% and +2% is a low of $255,000 to a high of $1.52 million. Net earnings in subsequent years vary depending on how much mortgage prepayments change and the assumed reinvestment rate of the cash flows. Generally, net earnings are greatest in a rising rate

environment and lowest in a falling rate environment. In a flat rate environment, this leverage transaction is expected to add an average $1.32 million in additional income each year, according to the shock analysis.

Again, the 3-year horizon for the shock analysis masks risk beyond the third year. After 3 years, when the FHLB advances mature, some of the GNMA principal will remain on the bank's books.

If rates fall 2%, which is the lowest earnings environment, roughly $4.4 million in mortgage principal would remain outstanding at the beginning of year 4. The bank would have to find funding for this amount of principal. With rates 2% higher, the projected outstanding principal after 3 years exceeds $26 million such that just 37% of the initial principal would have been repaid. Net earnings beyond year three would then depend on how this principal is financed. If rates were substantially higher, the spread would fall and could possibly move negative. In this case, the bank would need to finance the principal with core deposits to maintain even modest earnings. If the net spread were to go negative, any losses could again possibly offset the positive incremental earnings during the first three years.

Conclusions

Many banks that have ample liquidity should consider using leverage strategies to adjust their aggregate interest rate risk profile and/or supplement earnings.

Given the positive slope to the yield curve in today's recessionary environment, and the relatively unattractive yields on many loans on a risk-adjusted basis, borrowing short-term and investing in longer-term securities may allow the bank to reduce overall interest rate risk while adding to earnings.

This research describes two leverage strategies that were available during the past two months. Both involve borrowing via fixed-rate, bullet FHLB advances and investing the proceeds in GNMA securities. Because the GNMAs carry a zero risk weighting for capital adequacy purposes, the transactions do not adversely affect risk-weighted capital ratios.

The strategies do, however, carry interest rate risk. Rate shock analysis provides an estimate of the impact of interest rate changes on net earnings after implementing each strategy and the potential liquidity needs at the end of the investment horizon. As such, it demonstrates the trade-off between interest rate risk and the supplemental earnings. ***BJ***