

Handwritten mathematical content on a black background with a white grid. The content includes various mathematical expressions, a diagram of a cone, and geometric diagrams.

Mathematical Expressions and Limits:

- $\cos\left(\frac{1}{2}x+1\right)$
- $(1; \frac{2}{\sqrt{10}})$
- $\lim_{x \rightarrow 0} \frac{x^3-2x^2+4}{x^3}$
- $\lim_{x \rightarrow 5} \frac{\sqrt{2x+1}-\sqrt{x+6}}{2x^2-7x-15}$
- $\lim_{x \rightarrow \infty} \frac{5x^3-6x-3}{x^3-2x^2+4}$
- $\lim_{x \rightarrow \infty} (2x-7)[\ln 2x]$
- $\lim_{x \rightarrow \infty} \frac{y = \cos\left(\frac{x}{2}+1\right)}{y = \cos x}$
- $\lim_{x \rightarrow \infty} \left(\frac{5}{3}x' + \frac{2}{7}y'\right) + 3^2$
- $\frac{1}{2} < 1$
- $y = \cos \frac{x}{2}$
- $cp = \frac{a \cdot b \cdot c}{2}$
- $y = 3 \cos\left(\frac{1}{2}x+1\right)$
- $\sum_{k=0}^n b_k [(x-x_0) + x_0]$
- $\frac{3}{x^3} = \frac{5}{1} = 5$
- $\sqrt{5}x^3$
- $\frac{2}{\sqrt{7}}$
- $\frac{2}{x} \sum_{k=0}^n b_k x^k$
- $\frac{3}{x^3} = \frac{5}{1} = 5$
- $\sqrt{x+6}$
- $\frac{2}{\sqrt{10}}$
- $\cos \frac{x}{2}$
- $\cos x$
- $89^x + x^2 - 16$
- $\frac{2}{x} \sum_{k=0}^n b_k x^k$

Diagram: A cone with a dashed vertical line for height h , a radius R at the base, and a slant height of $\sqrt{7}$. The apex angle is labeled α .

Other Elements: A large orange dollar sign (\$) is drawn in the center. There are several coordinate systems and partial graphs of functions like $y = \cos x$ and $y = \cos\left(\frac{x}{2}+1\right)$ shown at the bottom.



The Rocket Science of Hedging

Hedging investments isn't some magic trick from above; it's a measure of discipline and communication.

By Dean Brown

Does mortgage pipeline hedging require wizardry and rocket science? Some executives at mortgage companies, community banks, and credit unions who don't have much experience in secondary marketing hold this misconception.

Frequently these executives believe they are better off selling loans with a best efforts lock, rather than hedging their mortgage pipeline and benefitting from the higher prices available through mandatory execution. However, the executives overcome their fears once they understand that they can exchange their current hedge cost—the pricing differential between the current best efforts price and the mandatory price for the same asset—for a much lower hedge cost that yields higher returns. All they need to do is make a few changes, develop a structured discipline, and implement a risk neutral-based hedging strategy.

Sounds simple enough, doesn't it? But how is it actually done? Is it wizardry and rocket science? Not at all. It just comes down to taking a disciplined approach to managing the inherent risks of pipeline management.

Policies, Procedures, and Reporting

The most essential step is having pre-established

policies and procedures and clear and concise reporting. Pipeline managers need to have data they can trust, because if you can't measure it, you can't manage it. The best reports provide a full array of detailed information about the at-risk pipeline, including critical data fields that impact pricing as well as a current mark-to-market valuation. The secondary marketing manager must know his or her pipeline, and the reports they use should detail the product mix, the purchase to refinance ratio, and a distribution by origination channel (e.g., retail, wholesale, correspondent, consumer direct, etc.)

The Fallout Factor

The next factor to consider is fallout. Accurately tracking and measuring the company's historic pull-through performance inevitably will translate into better hedge performance. Knowing the historic sensitivity of the pipeline to changes in interest rates will improve

the performance of the hedge position. Having the right analytics to accurately incorporate all of these factors into a detailed hedge recommendation supported by a thorough rate shock analysis translates into a disciplined approach to hedging, allowing the secondary marketing manager to be strategic and proactive in his or her decision-making process. By having the right data and reports and making informed decisions in a timely manner, he or she can execute well-thought-out strategies designed to maximize profitability and minimize risk.

After deciding to hedge, compiling accurate data, and getting reports in order, it's time for the pipeline manager to execute the hedge. Working with a seasoned and experienced hedge advisor to implement the hedge recommendations directly off of the reports is recommended.

Keeping Your Options Open

Experience has shown that in volatile markets, those lenders that incorporate option tools are better positioned to maximize their gain on sale results. The key to an effective options strategy is to accurately measure and track volatility. By determining the optimal amount of optional and mandatory

coverage required by the pipeline, the secondary market manager can successfully hedge his or her pipeline from fallout volatility and market movement.

One key ingredient of a successful options strategy is to implement the options coverage when implied volatility is relatively low. Then, in an effort to further minimize the cost, apply coverage that matches the optional exposure found in the pipeline—60 to 90 days—and purchase out of the money (OTM) or at the money contracts that provide the correct delta and gamma adjusted coverage for the least amount of expense up front. The result is that as market prices decrease, the amount of pipeline coverage provided by the put option contracts increases to help offset the expected decrease in loan fallout due to rising rates. Conversely, as market prices increase, the amount of pipeline coverage from the put option contracts decreases with the expected increase in fallout due to declining interest rates. In essence, over the term of the option contract, and for a single, upfront premium, the amount of coverage provided by the option contract expands and contracts with fluctuations in prices and changes in the pipeline, all the while maintaining stable profit margins.

The use of option contracts in conjunction with an efficient



delta hedge strategy allows the mortgage lender to maintain margins and reduce transaction costs and substantial swings in profitability that would otherwise result from trading exclusively with forward TBA securities.

Lenders that do not implement an options strategy find themselves exposed to greater fluctuations in both profitability and cash flow. They soon discover that they are constantly adjusting their mandatory coverage by selling additional forward TBA securities as prices drop and then buying those same securities back, but at a loss, as prices increase. Without a successful options strategy, bottom-line profitability decreases regardless of the direction of market prices. Experience has shown that over time, the cost of the options contract is less than the expected losses that the lender otherwise would incur. Just like purchasing insurance, the upfront cost of the options limits the firm's downside exposure and leads to maximum gain on sales at or above the firm's target thresholds.

Supplemental Strategies

With a successful hedging strategy in place, the mortgage lending institution is well positioned to implement additional strategies to further enhance its franchise value, attract and retain quality loan originators, and ultimately achieve incremental increases in target production volume at the required margin thresholds.

For example, in a float-down lock, a borrower locks his or her rate but has the option to "float down" or reduce the locked interest rate if market interest rates fall during the lock period.

An extended lock is an upfront lock for a period in excess of 75 days and frequently used for purchase money buyers looking to protect themselves from rising interest rates during the home shopping process. By definition, long-term locks are susceptible to higher fallout ratios and lenders must hedge accordingly.

Lastly, builder commitments represent an option offered by the builder to prospective

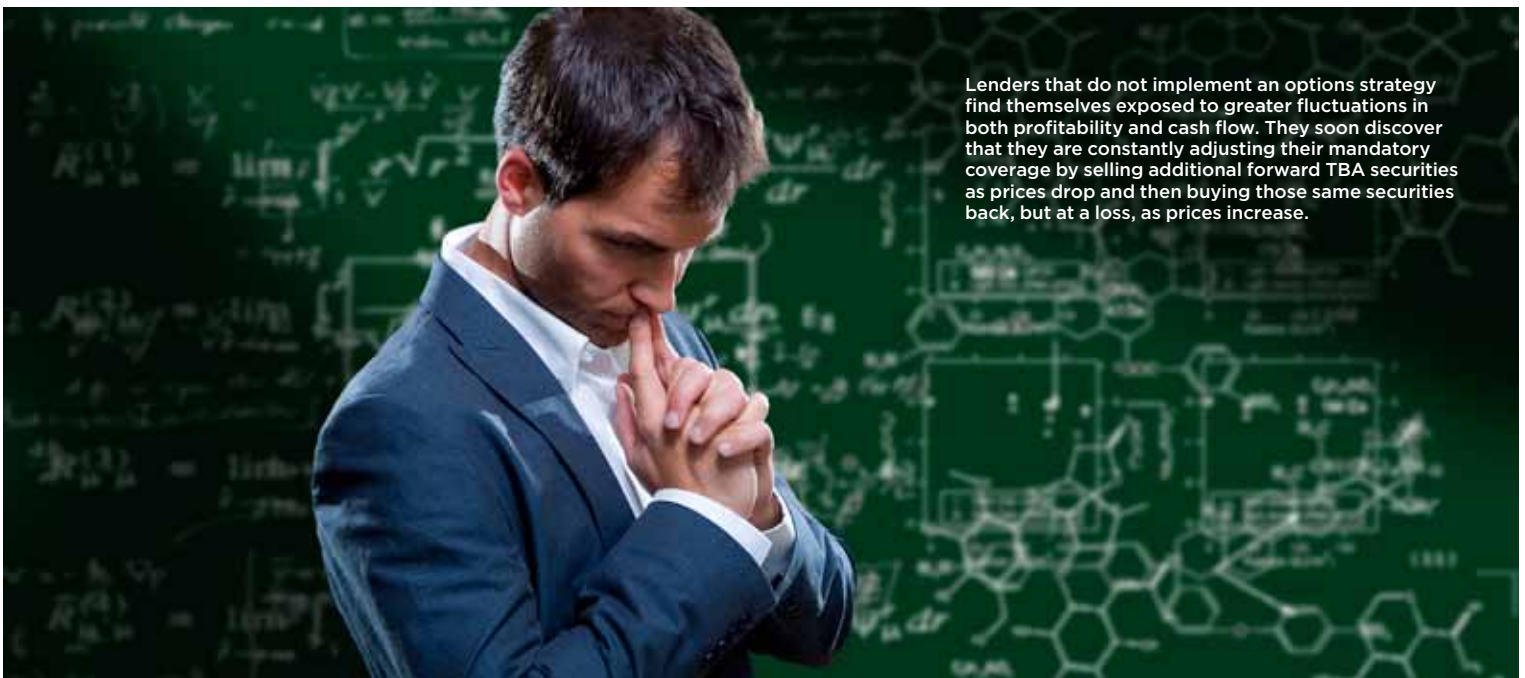
buyers to deliver a set rate upon completion of a new construction project. Given the different borrower profiles and the terms under which this loan is secured, it also must have a properly designed hedge strategy to match its anticipated performance.

It is imperative that pipeline managers recognize that the behavior of a float-down lock will be different from that of an extended lock, which in turn is different from that of a builder commitment. Although each of these features is hedged with option contracts, it is best if they are tracked separately and clearly identified in the pipeline reports to allow their unique behavior patterns to be modeled into the dynamic hedge recommendation.

Armed with a disciplined strategy, secondary marketing managers find they can proactively manage these additional variables in their pipeline, bringing added value to the firm and arming the sales force with additional tools to secure more loans and establish quality relationships with builders, Realtors, and other key referral sources.

In lieu of implementing a float-down strategy, some lenders feel they are covered by offering a simple rate renegotiation policy. But the truth of the matter is that in either case, the borrower is given the option to obtain a lower rate at some future date. Given that the borrower has the option to choose, the pipeline manager also should protect himself or herself by utilizing option contracts in lieu of forward TBA trades to protect the pipeline and profit margin from the increased fallout and the associated costs due to declining interest rates.

In conclusion, the bottom line is the bottom line. The most successful mortgage lenders, whether they be a mortgage banker, credit union, or depository institution, employ strategies to preserve margins while managing the inherent risks associated with hedging a mortgage pipeline, including having the right reporting to measure performance and make timely and informed decisions. They follow a daily discipline and the prescribed strategies to achieve their expected results. **M**



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