Hedging for Community Banks

SouthState
CORRESPONDENT DIVISION

Table of Contents

Introduction

For over 30 years, we have worked with community banks to help bankers mitigate risk, measure and improve performance, retain and attract profitable clients, and develop, introduce, and implement new banking products.

Over the years, community bankers have expressed interest in interest rate hedging. They have requested additional training and analysis on how these products generate fee income, increase loan stickiness, support deposit cross-sells, and improve overall bank performance.

This eBook is a comprehensive review of this subject and shares our many years of experience working with thousands of community banks across the country. For those readers who do not want this in-depth analysis but prefer a shorter primer on the subject, we also published a condensed, but still thorough, review of this topic. **Click here**

Your feedback is valuable to us. Please let us know what you think of the material, your experience with interest rate hedging, and where we can improve serving our clients. You may send your feedback to us here: **ARC@southstatebank.com.**

Click here if you would like to schedule a presentation to your bank's executive team (30 to 75 minutes, in-person or remotely) covering these key bank areas specific to your bank, geography, and competition.

Scan Me

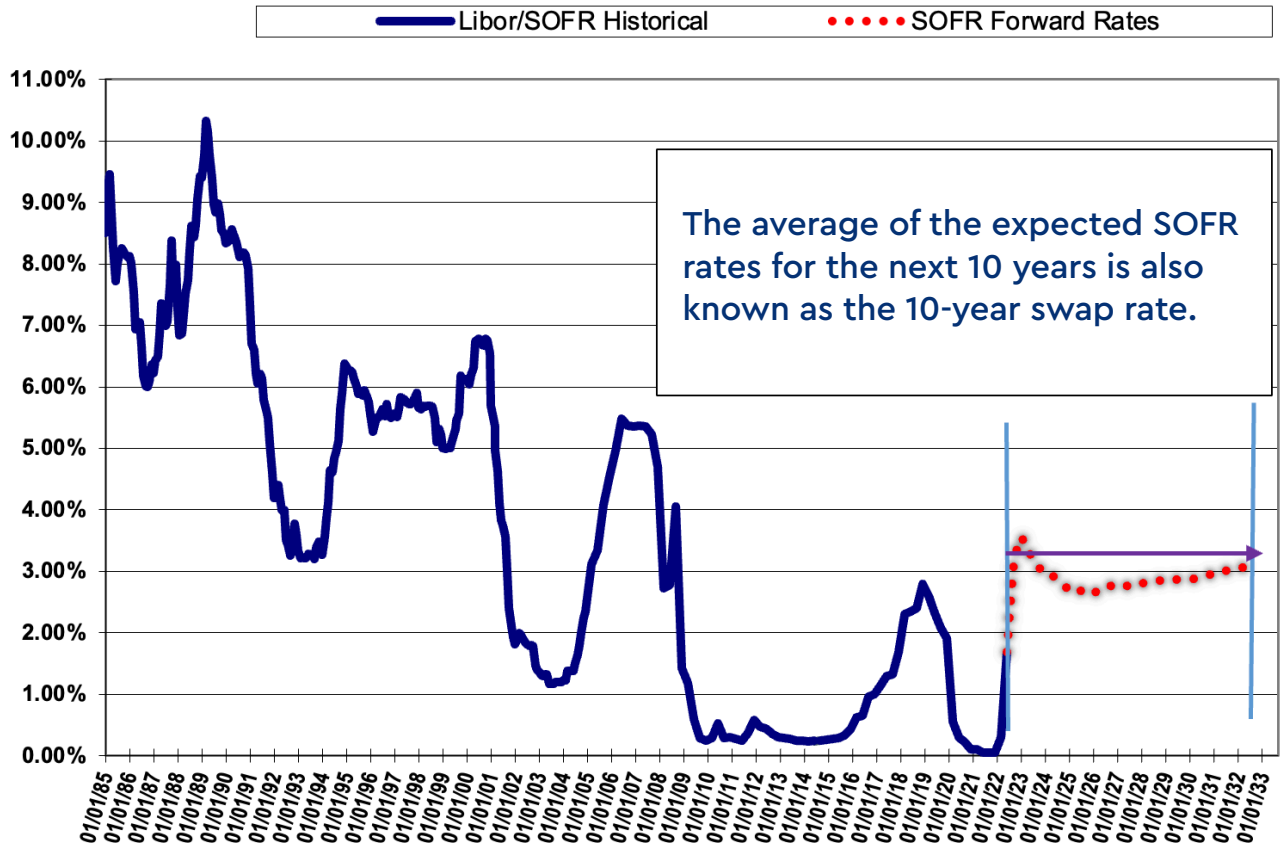
Section 1

What are Interest Rate Hedges?

1. What is a swap?

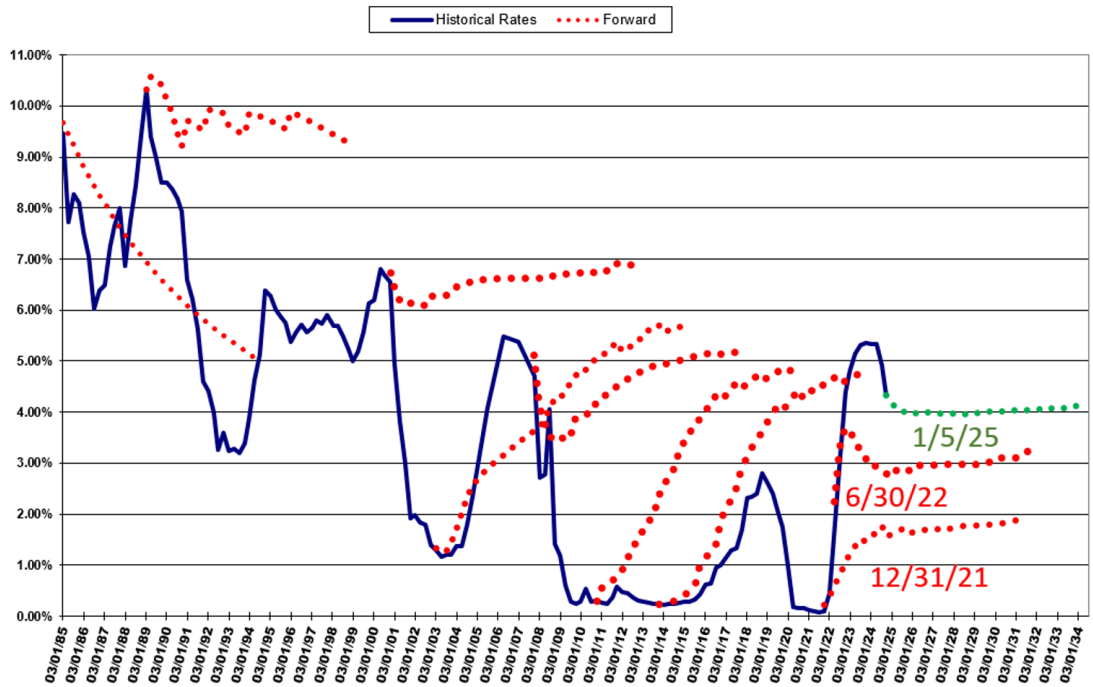
An interest rate swap is an exchange of cash flows between an entity that pays a fixed rate and a second entity that pays multiple short-term rates. At the inception of the swap, both parties expect to receive and pay equivalent economic value.

The swap rate is determined by the markets' expectations of where short-term rates will be over the life of the swap. A similar concept applies in the Treasury market – the yield on the 10-year Treasury is the markets' average expectation of the yield on the next 40 consecutive 3-month Treasury Bill yields. The graphic example below shows the markets' expectations of short-term rates for the next 10 years and the corresponding swap rate.



2. How is a swap rate determined?

While a swap rate is calculated based on the markets' expectations of short-term rates in the future for the swap term, the market is an extremely poor predictor of where interest rates will trend. The futures market is not always right or always wrong, but forward rates are a bad predictor for the future. Below is a graph showing in the blue line where short-term rates have been since 1985 to the present (Prime, LIBOR or Fed Funds are 99% correlated). In the dotted red line are forward rates for specific periods (the dotted green line furthest to the right is the forward curve at the beginning of 2025). During inflection points, and at other points in the past, the forward rates were not good predictors of the future.



If the forward market is a poor predictor of the future, economists are even less reliable. Economists are not prescient, but typically are paid to take a view, so they need to say/forecast outcomes.

However, the market (lending, borrowing, and derivatives) all use forward interest rate predictions to determine long-term rates. Any position against prevailing swap rates is a speculation against the collective wisdom of the market – which will, by definition, be correct 50% of the time.

3. What are caps, floors and collars and how are they priced?

Borrowers generally do not pay a fee to fix the rate on their loans, and the swap market is efficient for commercial loans as small as $250k. A swap may be used to fix a loan rate to eliminate the variability of payments for borrowers or to stabilize credit quality for lenders.

A cap is an instrument that limits how high interest rates can rise, for example, on variable rate debt. A floor is an instrument that limits how low interest rates can fall. A collar is the combined use of both a floor and cap. Typically, collars are structured so that a user buys a cap, and sells a floor to reduce the cost of that cap.

Four input variables dictate the price of caps and floors, as follows:

i) **Term of the cap or floor** – the longer the term, the more valuable the instrument because of the higher possibility of payout in the future and more payout periods. The market for caps and floors is liquid for up to five years and somewhat liquid for ten years. All else equal, the longer the instrument, the more value it provides.

ii) **Strike level** – the lower the floor rate, the cheaper the floor, and the higher the cap rate, the cheaper the cap. The relationship is not linear, however, since well out-of-the- money instruments are dear to brokers who may be asked to pay large sums on rare occasions. Therefore, even floors and cap strike levels that are five standard deviations from interest rate expectation levels have value.

iii) **Volatility** – more volatility increases the value of caps and floors. Another way of stating this is that the payout on these instruments becomes more likely as each standard deviation becomes wider. Unlike swaps, the value of caps, floors, and collars is driven by volatility.

iv) **Size of the cap or floor as measured in basis points**. For example, if the cost of the cap or floor is 1%, the buyer would pay $10k for a $1mm protection and $20k for a $2mm protection. But this is a textbook notion. There are substantial friction and transaction costs to buying these instruments in the market, and the cost of the cap or floor (stated as a percentage) increases sharply when the protection amount is small. Therefore, while a $100mm floor may cost 1%, the exact same floor for $1mm may cost 2%.

Intrinsic vs. Time Value of Caps and Floors
The value of a swap is known with certainty at inception. However, the value of caps and floors behave differently from swaps. The value of caps and floors is divided into intrinsic value and time value. The difference is significant and dictates how and when borrowers and lenders should use these instruments.

The intrinsic value of the cap is created when the strike level is lower than the implied forward curve (similarly, the intrinsic value of the floor is created when the strike level is higher than the implied forward curve). Let us consider a cap purchased today for five years with a strike level of 2.00% on SOFR. This cap has a high intrinsic value because we expect SOFR to be well above 2.00% for most of the next five years – in fact, SOFR is currently above 2.00%. Consider the graph above and the dots, which show the market's expected SOFR levels for the next 10 years – all the dots are above 2.00%.

The time value of the cap or floor is created by the possibility that rates in the future may go higher than the current implied forward curve predicts. For example, a cap purchased today for five years with a strike level of 10.00% on SOFR would have zero intrinsic value (we do not expect SOFR to reach 10.00% within the next five years). However, this cap is not worthless because there is some chance, however small, that SOFR may exceed 10.00% within five years. The time value represents the possibility that the implied forward curve will change over time as the market changes its view of future rates.

4. When to use options vs. swaps

Borrowers and lenders typically use swaps to eliminate variability. The variability of payment or variability of net interest margin. But volatility instruments such as caps, floors, and collars are not a substitute for swaps. Caps and floors are not generally purchased by market participants based on expectations of payout. The purchaser of a cap or floor is always better off from the intrinsic value of the instrument if the cap or floor never pays – if interest rates never reach the strike level of protection purchased. In other words, there is no economic benefit to purchasing caps for their intrinsic value. Outside of speculating, caps and floors are not purchased for their intrinsic value; they are purchased for their time value.

A cap, floor, or collar is purchased as an insurance policy that is better not used. Just like a homeowner may be relieved but not happy to have to claim on a home fire policy, a cap or floor purchaser is always economically ahead if the cap or floor expires worthless. This is vastly different from a swap, where the borrower or lender recognizes the economic benefit of the instrument for the duration of the contract.

Aside from some very sophisticated entities that buy caps because they believe that the market undervalues future interest rate volatility, most commercial borrowers buy caps as an insurance policy that they hope never to use.

Borrowers can decide on the cap level suitable for their business needs, but it makes no economic sense to buy volatility instruments for their intrinsic value. Instead, caps are purchased for their time value. There is no economic advantage for the borrower to purchase intrinsic cap value because the higher cost of the cap is already factored in the payout to the cap holder.

Borrowers who have a view on the future path of interest rates or especially have a different volatility view from the market, purchase caps as catastrophic insurance policies and set cap rates high enough to cheapen the cost of the cap but still retain some level of interest rate protection. These purchasers fully expect the cap to expire without any payout – which is the best outcome for the borrower.

The above concepts apply to other volatility products, such as floors and collars. Why would a borrower use a collar instead of a swap? The average borrower is unable to predict the future path of interest rates and much less be able to predict future volatility of interest rates which dictate the value of caps and floors. Most borrowers inquiring about caps want to eliminate a prepayment scenario associated with a swap, but when they learn about the cap fee, they often turn their attention to collars to lower the cap fee. However, a collar has a prepayment scenario – if interest rates fall, the floor becomes valuable, and the cap becomes worthless, resulting in a prepayment fee owed by the borrower. That prepayment fee is difficult to calculate upfront and cannot be easily communicated or documented.

While there are many ways of creating a zero-cost collar (finance the complete cost of the cap, by selling a floor), there is one zero-cost collar structure that tends to be best for borrowers who do not have a volatility view that is different from the market's view. That collar is where the cap and floor are struck at the same level – the borrower does not pay if rates go above that level, and the borrower does not get the benefit if rates fall below that same level. That structure is also known as a swap. A swap is the composition of a floor and cap at the same level and the prepayment scenarios are identical between a swap and a floor and a cap struck at the same level.

5. The stigma associated with derivatives

There are many historical examples of some sophisticated and some less sophisticated entities imploding through the misuse of derivatives. Barings Bank, Orange County (CA), Enron, Long-Term Capital Management, and other entities misused derivatives or did not understand the difference between hedging and speculating.

Using a bank as an example, you are hedging if your position creates more stable earnings when interest rates change. In contrast, you are speculating if your position creates more earnings when interest rates change in one direction and your position creates less earnings when interest rates change in the other direction.

Historically, community banks have hesitated to adopt derivatives for several reasons. The documentation was lengthy and complex, the regulatory compliance and reporting was cumbersome, the accounting was tricky, and the overhead cost of launching a hedging program was challenging. Most importantly, community banks found it difficult to sell the product to their average customer. If you only sell a few loan hedges a year, are the startup and maintenance costs worth it?

6. Balance sheet vs. loan level hedging

For loan-level products, the hedging solution is associated with individual loans. For balance sheet solutions, the hedge is associated with a set of assets or liabilities being hedged. The instruments available for use are similar – banks have successfully used swaps, caps, floors, collars, and cancellable swaps for both loans and balance sheets. The difference between the two options includes size, efficiency, accounting, and sales strategy. Community banks have historically used loan-level hedging because of the simplicity in accounting, fee generation opportunities, and the resulting lender pricing and structuring discipline.

The most significant advantage of balance sheet hedging is the efficiency in execution. Generally, balance sheet hedges are more efficient when the notional hedge size is $10mm or greater. Community banks can usually save anywhere from 5 to 15bps on execution costs – compared to loan-level hedging, where loans at least $250k in size are hedged. Another advantage of balance sheet hedging is that it immediately impacts the bank's balance sheet – it can extend or reduce duration with just one trade. The other side is that if the balance sheet composition changes over time, or the interest rate or loan environment changes over time – as they typically do – the balance sheet hedge initially implemented may no longer be the right hedging solution for the bank.

The biggest advantages of loan-level hedging are that it does not require an all-or-none decision and community banks can choose to apply this product as needed on a loan-by-loan basis. Further, the accounting is simple, and programs are available where the derivative is not on the community bank's balance sheet – SouthState Bank uses such a program called ARC. Loan-level hedging also allows community banks to generate fee income (which is generally not available through balance sheet hedges). Most importantly, loan-level hedging instills pricing and structuring discipline on lenders that removes free options to borrowers and shifts economic downsides and negative convexity away from the bank's balance sheet. Conversely, a balance sheet hedge almost always shifts negative convexity to the bank.

The table on page ten compares community banks' two hedging platform options.

	Loan-Level	Balance Sheet
Description	Each loan is hedged individually	A set of assets or liabilities are hedged
Instruments available	Swap, cap, floor, cancellable features, and combinations	Swap, cap, floor, cancellable features, and combinations
Execution and size	Available on loans as small as $250k with costs borne by the borrower	Efficiency is created with a hedge size greater than $10mm
Advantages	• Does not require an all-or-none decision • Simple accounting • May be added in small amounts as balance sheet, interest rates, and marketing opportunities change • Cost of prepayment shifted to the borrower • Marketing support for lenders and more disciplined pricing for bank • Ability to generate fees	• Borrower or depositor is not involved in the hedging process • Large and immediate hedge impact • Cheaper execution • Most effective for existing balance sheet GAP mismatch
Disadvantages	• Not immediately effective for existing balance sheet GAP issues • Requires lenders to market and understand the product	• Possibly complex accounting • Extensive ALM analysis required to achieve an effective strategy • Transfer repayment and convexity risk from borrowers and depositors to bank • More execution risk (one hedge trade vs. many and management must make one large decision on timing, instrument type, and notional amount)

7. ARC vs. ISDA derivatives

The most potent example of hedging vs. speculation is the ARC program offered by SouthState Bank. Historically, community banks have hesitated to adopt derivatives for several reasons. The documentation was lengthy and complex, the regulatory compliance and reporting was cumbersome, the accounting was tricky, and the overhead cost of launching a hedging program was challenging. Most importantly, community banks found it difficult to sell the product to their average customer. If you only sell a few loan hedges yearly, are the startup and maintenance costs worth it?

At SouthState Bank, we use an alternative to ISDA-based, back-to-back swaps. We believe that the ARC program offers an advantage against the national banks. The ARC program has the following benefits to the community bank lender and the borrower, as follows:

i) Only a short (4-page) and simple addendum to the promissory note as additional documentation. No ISDA documents.
ii) No derivative accounting for the lender or the borrower.
iii) Virtually no ongoing or upfront costs.
iv) SouthState Bank provides lenders with education and marketing support to sell the ARC program.

The ARC hedge mirrors the loan terms exactly – accrual, payment frequency, principal amount, and payment dates all match. The result is that the borrower is invoiced with one bill each payment period for the same P&I dollar amount. Therefore, the payment amount creates the equivalent of a fixed-rate note experience for the borrower. On the spectrum of hedging vs. speculation, the ARC program is on the hedging extreme because the community bank allows the conversion of a floating rate note into a known payment, decreasing the borrower's credit and interest rate risk.

General:	ARC	vs. Swaps
Fee Generation	✓	✓
Swap/Hedge Portability	✓	✓
Hedge for Unique Structures	✓	✓
Hedges for Forward-Starting Structures	✓	✓
Accounting:		
No Hedge Effectiveness Accounting	✓	✗
No Call Report Derivative Disclosure	✓	✗
No Derivative Capital Allocation	✓	✗
No Dodd-Frank Reporting	✓	✗
Documentation:		
No ISDA Documentation for Bank	✓	✗
No ISDA Documentation for Borrower	✓	✗
Collateral Requirement:		
No Independent Amount ($500k+)	✓	✗
No Additional Cash & Securities	✓	✗
Simplified Borrower Experience:	✓	✗

- ARC has all of the same capabilities of any swap program.
- ARC eliminates all derivative accounting headaches for banks.
- ARC reduces the number of pages required for documentation from 45 pages using swaps to four pages for ARC.
- ARC allows current loan settlement invoicing instead of having borrowers execute separate monthly swap settlements.
- ARC eliminates the requirement for loan officers to explain a complex transaction
- ARC is easier to understand reducing both sales friction and legal risk.

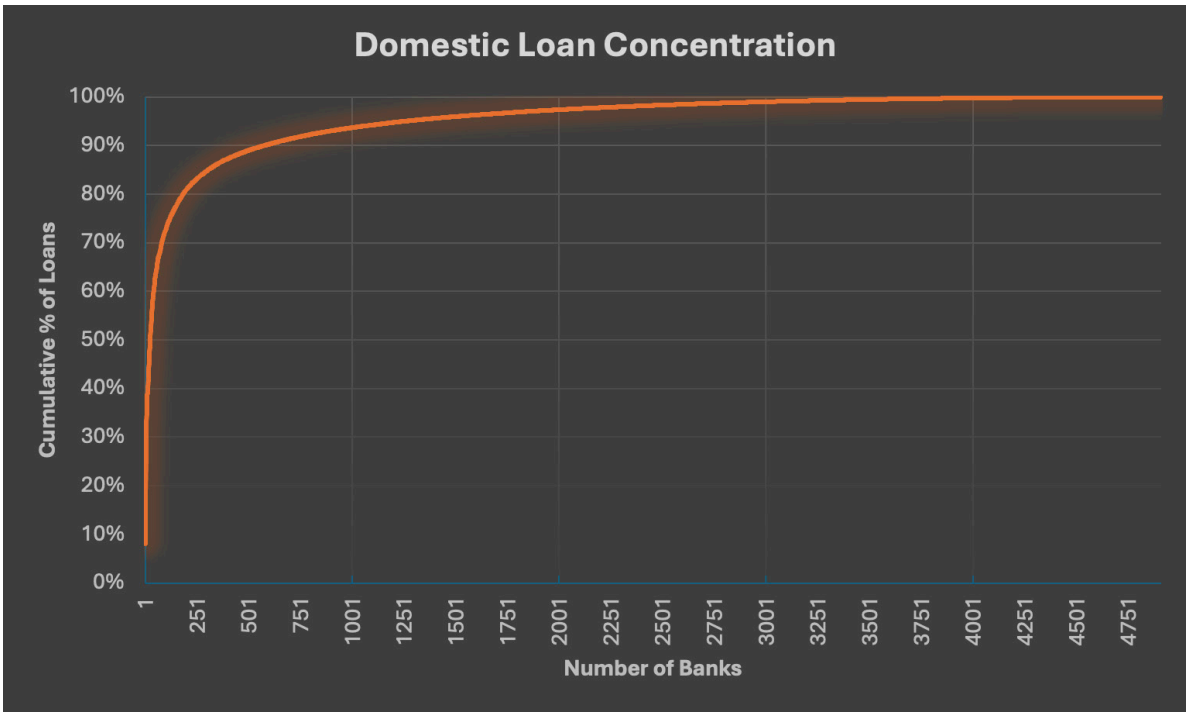
A simplified platform for borrowers and loan officers results in more transactions booked.

Section 2

Who Uses Interest Rate Hedges?

1. National, regional, and community banks

The graph below shows the concentration of domestic loans for all banks in the country, and it demonstrates that just a few banks control most of the loans. The same picture emerges for domestic deposits. The country's few largest banks hold most domestic loans and deposits, and the smallest 4,300 banks hold less than 20% of all loans and deposits.



The largest 100 banks dominate the industry with almost 75% of the market share. The number of banks that control the domestic loan market is summarized in the table below.

Number of Banks	%of Dom Loans
10	38%
20	46%
30	54%
40	60%
50	63%
100	73%
200	81%

A small number of banks control a significant majority of the loan (and deposit) market. Over the decades, the largest banks have been gaining market share while the total number of banks in the industry has been declining. All 20 of the largest banks in the country by asset size utilize interest rate hedges to manage risk and generate fee income. Of the largest 250 banks, 90% use interest rate hedges. Currently, 27% of all banks use interest rate hedges to manage some risk, up from 2% in 1985. Approximately 1,000 banks are reporting interest rate hedges on their balance sheets and another 500 community banks are actively using interest rate hedging with third-party providers, where the benefit of the hedge is retained by the community bank but reported on the balance sheet of a third-party vendor.

Because the largest banks hold a disproportionately large share of all loans, interest rate hedging tools are widely used in most of the loan market to manage risk, price more competitively and to generate fee income.

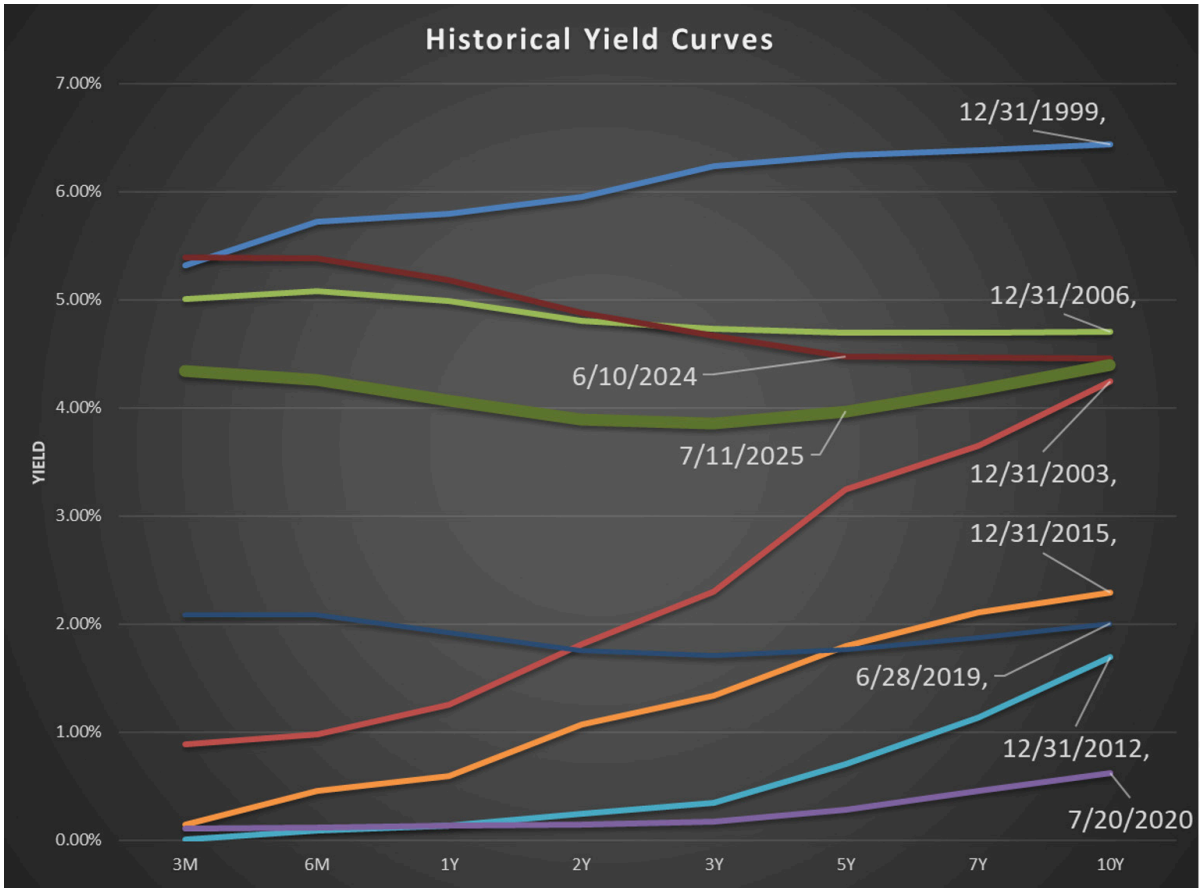
Most of the hedging activity at the largest 250 banks is related to fixing the interest rate on loans at borrowers' request. On average, 80.4% of the swap notional used by banks involves the bank paying fixed to broker-dealers and receiving fixed from commercial customers (a classic loan hedge scenario).

2. Borrowers and other end-users

The graph below shows the concentration of domestic loans for all banks in the country, and it demonstrates that just a few banks control most of the loans. The same picture. Borrower behavior is shaped by many variables, and one important variable is the shape and level of the yield curve. The shape of the yield curve can also help lenders understand borrowers' needs and better position the bank against competitors.

A yield curve plots interest rates with different maturity dates but for the same credit quality or counterparty. While swap and Treasury yields are the most frequently reported yield curves, a yield curve can be constructed for any credit counterparty. We will utilize the US Treasury curve to explain lending strategies that resonate with borrowers for various yield curve shapes and business cycles. The advantage of using a yield curve is that it allows lenders to compare different loan maturities against a common benchmark. Bankers can then price loans off the benchmark (using the yield curve to adjust for the tenor of commitment). However, the shape of the yield curve is also a predictor of economic output and growth, and potentially credit quality, interest rate risk, and is a powerful marketing tool.

The shape and absolute level of the yield curve is a strong factor affecting credit risk, interest rate risk, and sales/marketing approach to commercial loans. The graph below shows nine yield curves from 1999 to the present. Comparing different shapes, levels, and prevailing economic environments is very telling in how banks position their credit products and the performance outcomes for these banks.



In the table below, we will isolate each period and consider the germane signs from the shape and position of the yield curve on credit risk, interest rate risk, and commercial loan marketing. In December 1999, the US economy had experienced almost ten years of growth, and outside of the Y2K scare, lenders and borrowers were upbeat about the state of the US economic markets. However, interest rates were high based on the then current historical standards. Higher interest rates resulted in lower cash flow coverage.

However, businesses were able to plan for their cost of capital and manage their debt payments.

Further, the term premium (the cost to the borrower for 5 or 10yrs vs. float) was significant – over 110 bps. Borrowers could be convinced to float or lock shorter terms because of the cost of the term premium (higher cost to borrower for longer periods). Any reduction in interest rates helped both lenders and borrowers in added cost savings. Banks could position

commercial loans as floating, and short term fixed and attract borrowers. The table below outlines how the shape and level of the yield curve for each period altered lender and borrower motivation and changed interest and credit risks and altered sales opportunities for banks.

Period	Interest Rates	Credit Risk	Marketing Opportunities
1999 – many years of strong economic growth	• Higher interest rates stressed DSCR. • Cost to lock interest rates high. • Perceived equal possibility of rates rising or falling.	• Higher rates would cause some projects to default. • Curve not predicting a recession.	• Bankers could position credit products on the short or long end of the curve. • The cost of fixed rate credit was high and unaffordable for all but the strongest borrowers.
2003 – end of a shallow recession	• Low short term rates created cash flow relief for borrowers. • Concern that many borrowers would not cash flow if interest rates increased.	• Good credit environment for lenders and borrowers. • Yield curve predicted a strong economy.	• Lending at a 5yr portion of the curve was optimal for banks (acceptable risk for the prevailing 2.50% term premium). • Borrower avoided 7 or 10yr tenors because of the additional 100bps cost.
2006 – writing on the wall for the recession that started a year later	• A slightly inverted yield curve motivated borrowers to lock rates. • Banks concerned about falling rates included floors in commercial loans.	• The severity of the recession was not appreciated, banks continued to lend on riskier projects. • As the yield curve continued to invert, many banks were slow to react.	• Fixed rate loans on pristine credits worked best for banks. • Floating rate loans with floors helped banks retain margin. • Unfortunately, many banks migrated to higher risk credit rather than adjusted yield to focus on higher credit quality.
2012 – post-recession, but freshly imprinted	• Short term rates at historical lows, and expected to stay there for years. • Banks extended duration and were paid a healthy term premium.	• The yield curve predicted years of low interest rates, thereby, healing the economy. • Credit was difficult to obtain, and banks were well compensated even by higher tier borrowers.	• Banks that were lending could choose their customers. • Neither borrowers or banks were concerned about rising rates. • The 5yr term loan was the optimal product.
2015 – rising interest rates	• A shift in perception of rising rates created concern for borrowers and lenders. • The cost to lock interest rates was prohibitive for many borrowers.	• The yield curve continued to forecast economic growth and low probability of a recession. • Even at the higher end of the rate forecast, most borrowers could cash flow.	• Banks continued to succeed with short term financing or locking rates to 5 years. • Most banks decreased fixed rate lending because of the anticipated rise of short-term rates and higher funding costs.

2019 – uncommon inversion	• A short-term inversion and long-term flat yield curve. • Anticipated stability of rates in the near term.	• Projects that cash flow at inception may be risky if interest rates rise and DSCR declines. • In a recession, rates have little room to decline, adding additional concern for lenders.	• The cost to lock long-term funding is as low as it was during the depths of the Great Recession. • An unusual phenomenon where floating rate loans are more expensive than long-term fixed rate loans (this inversion would soon repeat itself).
2020 – pandemic	• An extreme event forced rates to the zero bound. • All-time historically low yield curve created cheap financing.	• Low interest rates were coupled with quantitative easing and fiscal stimulus. • Most obligors were able to survive because of cheap money and forgivable loans.	• Most quality borrowers take this opportunity to fix their cost of funding for as long as possible. • Banks make a common mistake to assume that interest rates would stay low indefinitely, and some did not survive the mistake.
2024 – Fed reverses "inflation is transitory."	• To quell inflation, the Fed inverts the yield curve. • Inflation peaked at 9.1% in 2022. • The yield curve shows the largest inversion in decades.	• Because of follow-on stimulus and negative absolute cost of borrowing (yield minus inflation), borrowers demonstrate benign performance.	• Banks take a discount to book fixed rate loans on balance sheet. • Banks without hedging programs see their asset duration extend and NIM decline as borrowers prefer long-term debt. • Banks with hedging programs can gain yield, fee income and longer relationships.
2025 – uncertainty, trade battles, and policy vacillation	• Fed pauses monetary easing in response to inflation and job strength uncertainty. • Yield curve remains inverted. • Conviction of further easing is questioned.	• Some borrowers anticipate lower future interest rates, but yield curve questions this assumption. • Based on the shape of the futures curve, Interest rates are likely to remain range bound • Credit quality remains intact.	• Banks that can match funding and asset duration continue to outperform. • On-balance sheet fixed rate loans disadvantage banks by 50 to 75bps in NIM. • An inverted yield curve eliminates the carry trade and favors fee income.

The current challenge for community banks is finding relationships, and not transactions waiting for the possibility of interest rates to decline – the latter is not a sound strategy for any borrower and lender.

3. The downside of hedging

There are various risks to banks that decide to use hedges to manage interest rate risks. The risks are as follows:

i) **Credit Risk:** In the event of borrower payment default, the Bank's credit risk may be higher or lower depending on interest rate movement that occurred between the time of loan origination and the borrower default. This value fluctuation is not recognized for GAAP for loans but is an economic exposure that should be reflected in the bank's underwriting process.

ii) **Interest rate risk:** The bank will earn a variable or fixed rate, depending on the nature of the hedge. The nature of the resulting revenue stream needs to be considered for any NII or EVE impact.

iii) **Liquidity risk:** Liquidity risks arise when banks are required to make hedge payments on behalf of the borrower or when banks are required to pledge additional collateral to secure a hedge.

iv) **Reputational risk:** A bank may incur reputation risk when the hedge provider does not perform under its hedge obligation. A bank may also incur this risk when borrowers claim that they were not properly informed of the risks of the hedge or were misled about the benefits of the hedge.

v) **Operational risk:** A bank's operational risk increases by using a hedging program. A separate process is required to handle hedge settlement notices and payments. Operational risks may arise if a bank cannot track settlement, payments, terminations and notices.

vi) **Compliance risk:** Some hedging programs require reporting and compliance through various regulatory bodies (including FDIC, OCC and numerous state regulators).

vii) **Accounting risk:** One of the main reasons community banks do not offer interest rate hedges is the requirement under some hedging programs to account for the derivative for GAAP and regulatory reporting purposes.

viii) **Counterparty risk:** Some hedging programs require that a bank trade the interest rate hedge with a counterparty without offsetting collateral. The failure of a counterparty without offsetting security collateral subjects banks to counterparty risk

.

ix) **Documentation risk:** The main risk in some interest rate hedging programs is the complexity and volume in documentation requirements for client use. The traditional hedging agreements may be difficult to explain, understand, and review.

4. Accounting, reporting, collateral and capital allocation

Certain hedging programs require that banks using interest rate hedges account for the derivative, report usage, allocate capital, and manage two-way collateral flow. The specifics of such management is beyond the scope of this eBook. A summary comparing the SouthState Bank's ARC program and traditional swap programs is shown below.

Accounting:	ARC	vs. Swaps
No Hedge Effectiveness Accounting	✓	✗
No Call Report Derivative Disclosure	✓	✗
No Derivative Capital Allocation	✓	✗
No Dodd-Frank Reporting	✓	✗
Documentation:		
No ISDA Documentation for Bank	✓	✗
No ISDA Documentation for Borrower	✓	✗
Collateral Requirement:		
No Independent Amount ($500k+)	✓	✗
No Additional Cash & Securities	✓	✗
Simplified Borrower Experience:	✓	✗

5. Direct and hidden costs of hedging for community banks

There are many reasons for bankers to consider offering a swap program for its better clients, including, generating fee income, enhancing credit quality, interest rate risk management, client retention, and loan growth. However, there are actual costs to a community bank in selling, booking and processing swaps on its balance sheet. There are a few key elements for banks to consider:

a) **We have seen banks that have booked one swap and discontinued their program, and we are in contact with community and regional banks that have booked over 500 swaps and are seeking relief from the processing costs of these swaps**. The cost to process a single swap settlement payment is approximately $25. There are two payments per period (which are typically monthly) – one with the broker-dealer and one with the customer. This represents a major risk of a swap program because these costs continue for years after the fee revenue from the swap is recognized.

b) **Banks are required to allocate capital for interest rate swaps**. The easiest way to calculate the cost of this capital is to consider a conversion factor matrix for calculating potential future credit exposure. That factor is 30% for interest rate swaps over 10 years. Assuming 8% capital and 11% required return on capital, a $1mm swap has a cost to the bank of $2,640 per year. This represents one of the largest costs of a swap.

c) **Banks need to post collateral for derivative exposure**. The collateral has two forms: initial margin and variation margin. Initial margin is approximately 3.5% of the swap amount for 10-year swaps, and we calculated future variation margin using a potential future exposure measure of 50 to 95% confidence level Value-at-Risk calculation. We then use 41bps opportunity cost to a bank of posting Treasury securities rather than being able to hold a higher yielding MBS.

d) **We have used various valuation and accounting services**. The lowest cost that we have seen for valuation and accounting entries from an outsourced provider is $200/q. Some consultants will include that charge in their overall hedge consulting fees. However, it is important to consider that a 10-year swap has 40 periods of measurements and accounting entries. Unfortunately, hedge consultants will not commit their services for the expected life of the swap. Therefore, the consultant may leave, or the bank may stop running a swap program, but the valuation and accounting requirements continue until the maturity of the swap.

e) **Most community banks cannot handle the documentation, marketing, and ongoing reporting associated with a swap**. Consultants are typically hired to perform this function. This service can vary in cost but 6bps of the swap amount per year is the minimum cost we have witnessed. Banks need to consider that consultants are paid upfront for the entire life of the swap (6bps times 10, paid up front out of the hedge fee). Therefore, if the consultant discontinues the engagement in year two, or if the consultant goes out of business, the entire 10yr fee has already been made by the bank. The upfront cost is higher if the community bank decides to proceed with internal hire rather than a hedge consultant.

f) **One important cost that community banks typically do not consider but is a major issue at national banks is the cost of legal challenges by users**. Swap documentation is complicated, voluminous and amorphous. Some borrowers will challenge the cost to unwind their hedge position. While community banks can forgive internal prepayment provisions, the unwind cost of the swap is a hard cost that must be paid to the broker-dealer. If a bank cannot collect this unwind amount from the borrower, that cost is borne by the community bank. Unfortunately, the unwind cost increases when credit issues arise and collateral values deteriorate (that is the nature of the correlation between credit, interest rate and property values). Banks are left with a choice of taking reputational risk trying to enforce incomprehensible documents or taking the unwind cost themselves. If that unwind is relatively small, it is in the bank's interest to take that hit. This is an actual cost that will be incurred (albeit infrequently) and we calculate it at $300 per $1mm per year.

g) **Finally, there are the normal upfront costs of a swap program such as legal review, training of executives, processing personnel, and internal accounting (even if the actual MTM and hedge accounting are outsourced, internal entries must be made, and people must be trained)**. There are also minimal ongoing training costs for sales and executives if any swap program is to be successful.

Considering all of the above costs on an individual swap, we can now measure the costs of launching and maintaining a swap program as shown in the table below.

$1 mm 25 due 10 swap	Annual Cost-direct	Upfront Costs-Indirect	Additional Annual Indirect
Documentation			
Training			
Sales		$2,000	$15,000
Executives		$40,000	$2,000
Processing ($25/m)		$2,000	
Accounting (outsourced)		$2,000	
Collateral			
Opportunity Cost (41bps MBS vs. T)			
Initial Margin 3.5%		$144	
Variation Margin 50% VAR		$121	
Capital		$2,640	
Accounting ($200/Q_)		$800	
Consulting (6bps)		$600	
Legal Challenges		$300	
Sum	$5,205	$57,000	$17,000

It certainly does not make sense to start a program if a bank intends to offer just one swap. As the anticipated volume increases, the average cost per swap decreases. We can also anticipate and calculate additional efficiencies as swap volume increases. The table below shows our estimate cost over an entire 10-year period for a swap, assuming various volumes for a community bank.

	10-year Costs	
	Total Costs	**Cost per swap**
1 swap	**$126,047**	**$126,047**
2 swaps	**$178,094**	**$89,047**
10 swaps	**$594,472**	**$59,447**
50 swaps	**$2,416,122**	**$48,322**
100 swaps	**$3,717,302**	**$37,173**

The average commercial swap at a community bank will generate approximately 1% to 2% in hedge fees. The economics (outside of the low costs of using the ARC program) do not show that a swap program is net positive strictly from an income/cost analysis. If community banks do choose to offer a swap program for their customers, it is not because of the net profitability of the swap directly. Instead, other benefits drive the decision, such as marketing, credit enhancement or competitive pressures.

Section 3

Impact on Profitability

1. Prepayment provision, prepayment speeds, and profitability

Loan prepayment provisions are essential tools for commercial banks. Loan prepayment provisions lower prepayment speeds (especially in a stable or declining interest rate environment) and drive higher ROA for banks. There are four main reasons why prepayment provisions increase profitability for banks. The four reasons are as follows:

a) Decrease the value of the option held by the borrower to repay the credit when interest rates or credit spreads are lower.
b) Increase the lifetime value of the relationship.
c) Increase cross-sell and upsell opportunities.
d) Reduce negative selection bias in an economic downturn.

Banks use four standard prepayment provisions for commercial loans. The first is a step-down, and it is by far the most common prepayment provision used by community banks. For example, on a 5-year loan, the bank may charge a 5,4,3,2,1 prepayment. The borrower pays the number (expressed as a percentage) times the loan amount corresponding to the year of prepayment. The advantage of this prepayment provision is its simplicity.

The second prepayment option is a lock-out. This provision prohibits any prepayment during a specified period. This provision is rare, but we see it utilized in municipal financing, but commercial borrowers rarely accept it.

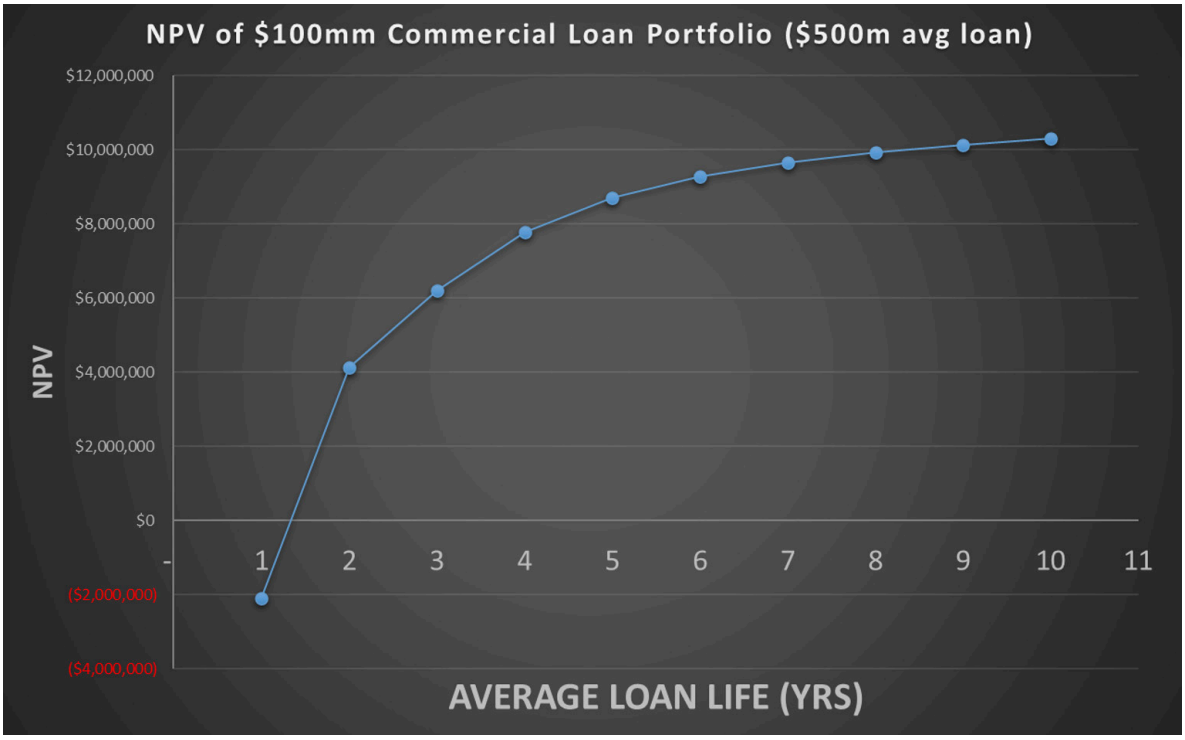
The third prepayment option is defeasance. This provision is used extensively by insurance companies and conduits. This provision is disadvantageous to borrowers and rarely correctly explained to clients. We have never seen a borrower presented upfront with a termination scenario for a defeasance – if they had, they would never take the loan.

Finally, more sophisticated banks use a symmetrical break even provision. This provision trues up or creates a neutral cost/benefit for prepayment based on interest rate movements. From an interest rate movement perspective, the bank and borrower become indifferent to prepayment whether rates are higher or lower. The provision better aligns with both the lender's and the borrower's interest rate sensitivity, and it is a standard provision at most national and larger regional banks that offer long-term fixed-rate financing.

Appropriate loan prepayment provisions increase the expected average loan life – the measure of the amount of time that principal is outstanding on a loan. This average life is driven by many factors, including amortization period, economic circumstances, nature of the loan and the expectations of the borrower, and most importantly, by contractual term and prepayment provisions. The relationship between prepayment provision, expected average loan life and loan profitability warrants additional discussion.

The average loan life affects the profitability of a loan portfolio. Our analysis and modeling shows this clearly. We calculated the NPV of income for the $100mm portfolio, $500k average loan size, for various average expected lives. The graph below shows the net present value (NPV) of income over a 10-year period.

On the spectrum of hedging vs. speculation, the ARC program is on the hedging extreme because the community bank allows the conversion of a floating rate note into a known payment, decreasing the borrower's credit and interest rate risk.



The expected life of a commercial loan is a major driver of profitability. As the expected life of the loans in the portfolio shorten, the NPV of income decreases, and vice versa. The NPV of income dips below zero with 1-year average expected loan life. The sensitivity between average loan life and NPV of income is even more pronounced for smaller loans.

Commercial loans have thin profit margins after accounting for ongoing costs such as COF, credit charges, and loan maintenance costs, but most importantly, commercial loans have high upfront origination costs. This behavior is especially pertinent for smaller credits – those below $1–2mm in size.

Hedged loans subject the borrower to a symmetrical break even provision. This extends the life of those loans substantially and, therefore, makes these loans more profitable for the bank.

2. Cross-sell and upsell opportunities

Studies show that the most profitable commercial clients at banks buy more than one product at those banks, and there is a strong positive correlation between profitability and number of products sold and the bank's size of customer wallet. For the banking industry, upselling and cross-selling has a high and disproportional impact on profitability.

Upsell versus Cross-sell

Upselling is defined as selling the client more of the same product in quantity, volume or time. In the banking industry, the time factor is extremely important. The upsell may occur at the initial purchase or subsequent purchases. Again, unique to banking, the subsequent purchases are crucially important to profitability.

Cross-selling, on the other hand, is defined as selling the client additional complementary products or services. Again, we believe that banking is a special industry where some products may appear profitable and are not, or vice versa. Being able to quantify profitability and identify profitable customers is key to using upselling and cross-selling techniques in banking.

Loan hedging can help banks structure commercial loans to maximize cross-sell and upsell opportunities. Below is a case study showing how this can be accomplished.

Case Study

A community bank in the Southeast was competing for a piece of credit business for a manufacturing company. The manufacturing company had a long-time relationship with a national bank and the community bank lender was struggling to make inroads with the company's CEO and owner. The CEO finally agreed to let the community bank make a pitch on $900k acquisition financing facility. The CEO indicated that to be competitive, the community bank needed to provide the loan at or below 6.00% fixed rate. The regulatory ROE for that loan would have been a negative 5.0% and the community bank was struggling with the viability of this transaction. Luckily, the community bank was using a hedging program and through the output of a loan pricing model and using the power of cross-sell, upsell, and capital market understanding, the community bank was able to win almost the entire banking business of the company and generate an 11.6% regulatory ROE.

The community bank pitched for the entire banking relationship, which included deposits, treasury management, and some investment services. The bank offered a 10-year loan commitment to increase revenue and enhance ROE, with embedded prepayment provision to increase expected lifetime value, and the bank gained hedge fee income. The bank made the financing conditional on the company's treasury management and wealth investment business. Finally, the bank made the case that now was the time for the borrower to consolidate and term out debt given level of interest rates and amount

Cross-sell, Upsell, Structure	Results
Increase loan size to $7mm	Increasing the revenue base resulted in an increase of ROE from negative 5.0% to positive 2.0%. The bank's fixed overhead costs for new loan booking makes larger loans more profitable.
Increase commitment to 10-yrs	Increasing the loan commitment term to 10 years increased ROE from 2.0% to 5.3%. Longer repayments result in longer revenue stream and ability to recapture upfront booking costs.
Embed prepayment provision	Prepayment provisions increase the stickiness of the loan, resulting in a longer revenue stream and more cross-sell and upsell opportunities. In this case, we only captured the expected longer loan life resulting from a symmetrical prepayment provision, and this increased of ROE from 5.3% to 6.6%.
Deposits	This is one of the best cross-sell opportunities for community banks, and while the borrower diligently manages liquidity, the business requires about $240m in ongoing DDA balances. This cross-sell increase ROE from 6.6% to 7.2%.
Hedge fee income	The bank was able to offer an attractive fixed rate to the borrower through a loan hedging program at 2.50% credit spread. The bank also recognized a $116m upfront hedge fee, and this increased the ROE from 7.2% to 8.4%.
Investment and Treasury Management	The community bank was also able to generate almost $3m/month in additional fee income. While not every bank will have this fee opportunity, this cross-sell increased ROE from 8.4% to 11.6%.

of uncertainty. The borrower was able to obtain the financing at just over 6.00% fixed rate (for 10 years) and the community bank was able to generate 11.6% regulatory ROE, with a growing local manufacturing company that had plans for future expansion and acquisition – further driving the community bank's opportunities for upsell and cross-sell. The math showing the upsell and cross-sell benefits are explained in the table below and shows how the bank turned a negative 5% ROE client into a positive 11.6% ROE.

3. Profit analysis of hedged loans

We analyzed community bank profitability on hedged commercial loans to those same banks' reported ROA/ROE. Our aim was to measure the impact, if any, of loan hedging on bank performance. We measured the risk-adjusted return on assets and equity for nine community banks ranging in asset size from $350mm to just under $8.5Bn. We were able to measure the RAROC for approximately $501mm hedged loans (154 loans in total) to understand why these banks used loan-level hedging to book this portfolio of loans. All of these banks are utilizing RAROC models to measure risk adjusted return. We then compared the RAROC on these hedged loans with the banks' general financial performance and based on our RAROC modeling attributed which factors benefited or detracted from ROE as influenced by loan level hedging instruments.

A summary of the loan portfolio is shown in the table below.

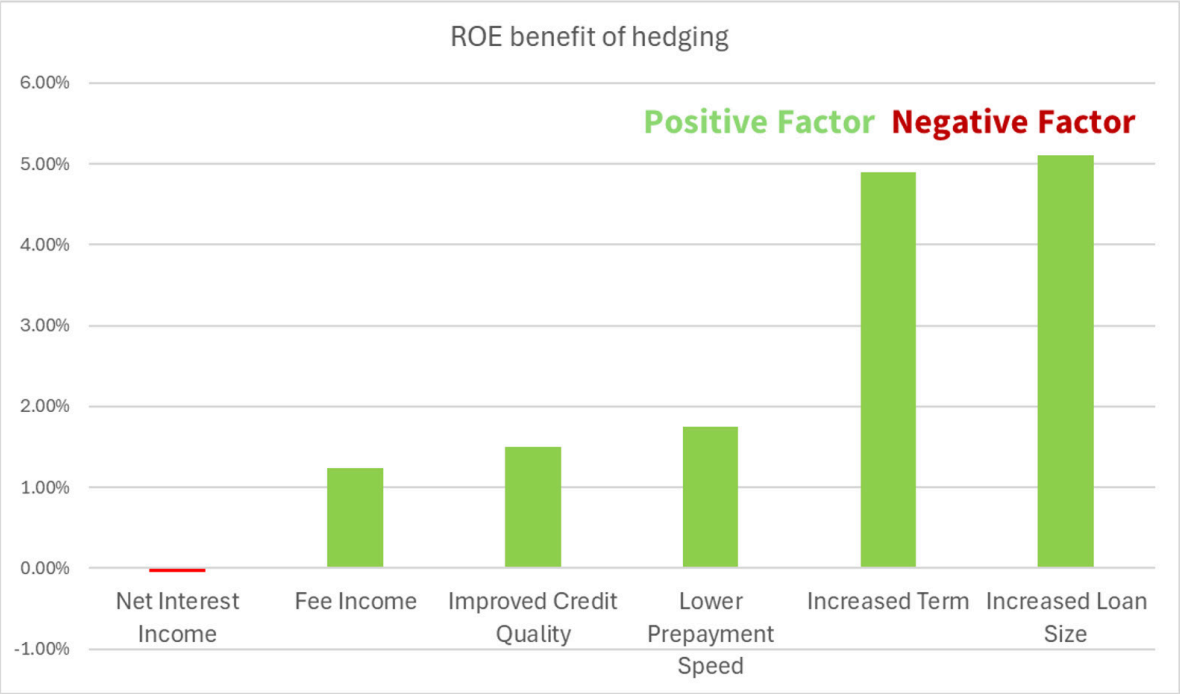
Max loan size	$34,000,000
Min loan size	$140,000
Average loan size	$3,253,826
Sum loans hedged	$501,089,213
Number of loans	154
Average LTV	59.6%
Average GDSCR	2.02
Average DSCR	1.92
Average hedge fee income	1.03%
Average credit spread to SOFR	2.56%
Average loan commitment term (yrs)	8.31

We compared the risk adjusted return of the hedged loan portfolio for each bank, to that bank's year-end reported ROA/ROE. The results appear in the table below.

Reported ROA	0.94%
Reported ROE	10.49%
Hedge loans average ROA	2.22%
Hedge loans average ROE	24.94%

For each bank, the portfolio of hedged loans exceeded that bank's reported ROA/ROE. On average, the hedged loans RAROC was 2.22% ROA and 24.94% ROE – this is more than double the group of banks' reported performance. These hedged loans created value for these nine banks as measured by RAROC. The hedged loans benefited from longer term, increased loan size, improved credit quality, and fee income.

We measured the benefit of hedging compared to the average bank's ROE based on NIM, fee income, credit quality, lower repayment speed, increased commitment term and increased loan size. Our conclusions appear below.



While hedged loans had slightly lower NIM (thus lowering the ROE on this portfolio), every other factor associated with these hedged loans contributed to the ROA/ROE return for these nine banks. The biggest drivers of ROE performance were increased loan size, followed by increased loan commitment term (accounting for 66% of performance increase for hedged loans). One driver for ROE performance we could not measure was the ongoing cross-sell opportunity that longer-term loans may offer to community banks. This would require a longitudinal study to investigate whether over time banks can improve performance by cross-selling higher valued products such as deposits, treasury management and other fee businesses.

There are real and direct benefits for community banks to use loan-level hedging to generate additional performance, retain more coveted clients, and attract higher credit quality borrowers. Our study shows that most a community bank's most profitable commercial borrower customers are composed of larger, longer, more stable, and higher credit quality clients.

4. Balance sheet vs. project finance

Properly structured commercial loans can lead to a longer relationship which normally are more profitable for banks. Unfortunately, some banks offer loans with built-in or planned obsolescence – making those loans shorter and less valuable to borrowers. Many commercial loans are structured to be called by the lender with any of the following: borrower change, collateral change, modification to term, cash out financing, change to business model, or business expansion. Conversely, we see many community banks that permit these changes (subject to credit underwriting) without requiring the credit to be prepaid. This latter strategy increases average loan life and enhances the client's affinity with the bank.

The difference between balance sheet financing versus collateral financing is profound in increasing value to both lender and borrower. On a typical collateral-financed loan, the loan is callable when the borrower sells the collateral, asks for modification of the security, the term, or the pricing. On the other hand, for balance sheet financing, the bank makes the loan based on the strength of the borrower's balance sheet and business model (the loan can still be secured by collateral). This balance sheet financing can be retained by the borrower with changes to collateral, term, pricing, even borrower entity if the bank can underwrite the credit. Balance sheet loans lead to longer relationships and more profit for the bank. We have seen many community banks move to offer balance sheet financing to their strongest, more sophisticated, and profitable clients. By their inherent structure and prepay provision, hedged loans are more readily available as balance sheet financing allows banks to grow balances, defend clients from being poached by competitors, extend the expected loan term, and grow deposits.

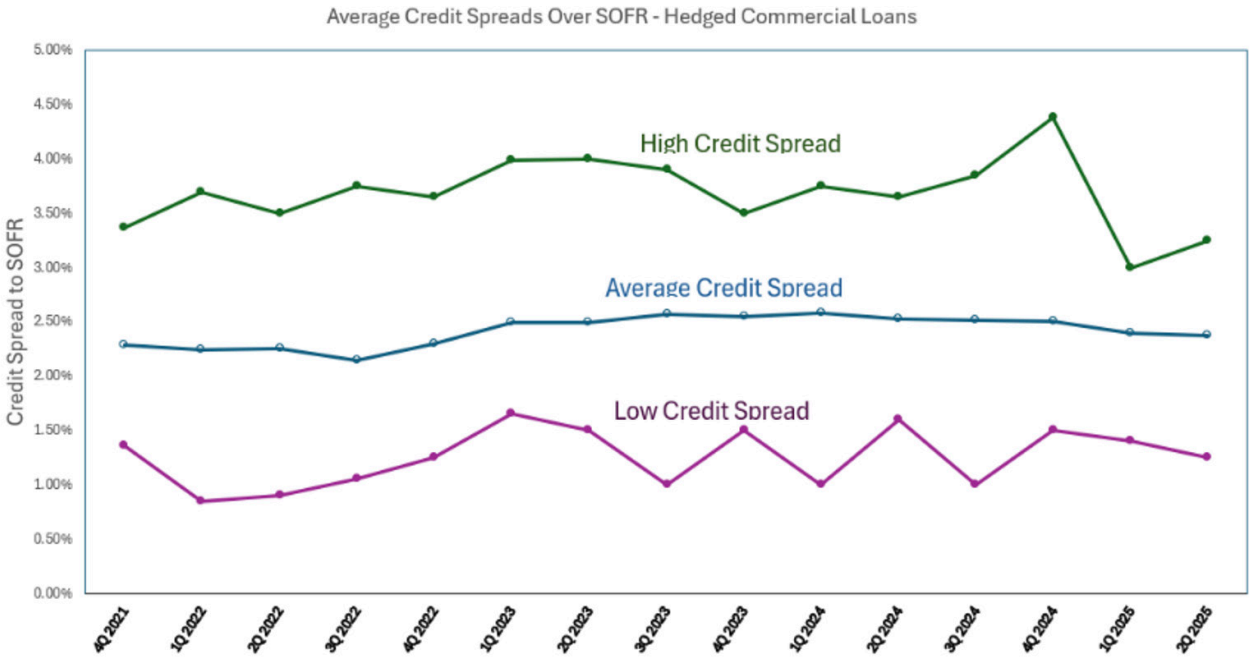
5. Risk without reward

Most bankers would refuse to accept risk without reward (or revenue). It makes no sense to risk the bank's capital without adequate compensation. With a flat yield curve, and the average community bank's cost of funding is highly correlated to Fed Funds and SOFR (the industry's average is over 90% with a about a 6-month lag). Fixed-rate loans originated during a flat yield curve environment create risk without return for many banks.

Most banks' cost of funding is highly correlated to shorter-term rates, and banks generally prefer shorter loan duration – floating, adjustable, or fixed rates of up to one to two years. This is where the banks take minimal interest rate risk. Going further out on yield curve may make sense if banks can generate additional loan yield – this is called a carry trade. Traditionally, the carry trade offered banks over 1.00% in additional pickup in yield between COF and the five-year term (approximately 1.15% over the last 30 years, and up to 2.00% during some periods). However, with the current shape of the yield curve, banks generate no additional revenue by extending duration. Therefore, in today's market banks maximize yield and minimize risk by keeping loan duration short.

6. Hedged loan pricing

The graph below shows hedged commercial loan pricing as a spread to term SOFR for community banks. The data represents almost 2k loans over 4 years. We consistently observe that average credit spreads are relatively flat with an average of 2.41% credit spread over term SOFR in the last four years. Over that same period, the average of the high credit spread is 3.68% and the average of the low credit spread is 1.25%. The average LTV and DSCR over that same period is 65.3% and 2.01X, respectively. These loans have an average contractual term of 9.1 years, and average amortization period of 22.1 years.



This consistent pricing data reflects a few important market forces:

1. While not all community banks using loan level hedging utilize a RAROC loan pricing model, these community banks do compete for loans with other financial institutions that utilize RAROC models. The average credit spread corresponds to 15% to 25% ROE for the credit facility.
2. The loans in the data set are above average in size ($2.71mm) and above average in credit quality (65.3% LTV and 2X DSCR). This is one reason that the loans are more profitable for community banks.
3. Community banks using a loan hedging program generate additional upfront hedge fee income, which can equal up to 2.5% of the hedge amount (the average has been 1.35% hedge fee income as percentage of the loan amount). This additional non-interest income makes these loans more profitable.
4. While difficult to measure for each specific loan, most hedge loans represent relationships for community banks. Banks are originating these loans with the expectation of additional credit, deposit, and fee cross-sell and upsell opportunities.

Section 4

Tools For Community Banks

1. Hedge fee income and calculator

Future payments to be made by a borrower on a hedge can be paid to the lender upon execution of a hedge as a fee. This fee is the economic value of the swap that is executed above prevailing market rates. This fee is paid to the bank at execution of the swap and may be recognized by the bank as upfront noninterest income.

For example, a $2 mm loan may be hedged through ARC on a 25-year amortizing schedule with a 15-year call. The starting hedge rate is 4.00%, and the bank's required credit spread is 2.00%. The borrower's rate without any fee is 6.00% (hedge rate plus the spread). However, if the borrower is willing to pay 6.10% and the bank is interested in a hedge fee, the hedge provider will embed the 0.10% spread into the hedge rate. The borrower will pay a hedge rate of 4.10% plus a credit spread of 2.00% or 6.10%. The present value of the 0.10% spread in this example is approximately $20K.

Given a borrower's willingness to pay an acceptable all-in fixed rate, banks may choose how much income to allocate to fee and how much to interest income. Having the ability to apportion revenue to either interest income or fee income is a powerful tool used by national banks for decades.

Recognizing fee income versus interest income has certain advantages for banks. Fee income may be recognized immediately, whereas interest income is recognized over the life of the loan. In today's competitive environment this is particularly important for banks. Furthermore, if the loan prepays, as many loans do, interest income ceases, but the hedge fee received will remain with the bank. National banks have used hedge fees to increase their competitiveness when pricing their swapped loans.

Download an excel calculator that may be used to approximate hedge fee income for various loan sizes and structures.

2. Explaining prepayment provision and scenario builder

A swap prepayment provision is normally called symmetrical yield maintenance (SYM). SYM is intended to compensate the lender for the loss or gain incurred because of the borrower's prepayment. For example, a bank that issued a 10-year loan at a specified interest rate did so with the intention of earning a projected return based upon that specified rate. When the borrower decides to repay the loan after only 5 years to take advantage of lower rates, the bank's earnings projections are invalidated since instead of getting their original (higher) yield, the bank can only reinvest its capital at the lower current rate.

SYM may be positioned as a borrower-friendly or equitable prepayment calculation because it allows the borrower to collect a fee if rates rise and the loan/hedge combination is prepaid. This prepayment provision makes sense for borrowers that hold any of the following expectations:

1. Borrower believes that interest rates will rise over the contractual life of the loan;
2. Borrower expects to hold the loan for a substantial portion of the contractual loan term; or
3. Borrower expects to have future financing needs on alternative or additive projects/properties and would like to maintain the fixed rate established on this loan for those likely future projects/properties.

Why should a borrower choose a loan with SYM if it means you will have to pay a possibly large penalty to prepay? The answer is that it depends on what is important to the borrower. If the borrower does not have any plans to prepay, thinks rates are going up or wants the lowest rate, SYM makes sense.

Most long-term loans (over 5 years) require it, so borrowers have limited options. Also, the borrower benefits with a loan rate that is 50–100 Bps lower than similar loans with step-down or more flexible prepayment penalties.

There are additional considerations for SYM, especially for the ARC program. As follows:

1. Symmetrical Yield Maintenance follows a simple formula based on: a) the term left in the loan, and b) the interest rate movement from the time the hedge rate was established at closing to a prepayment event.
2. The fee is the present value of the difference between the starting and ending hedge rate, multiplied by the loan amount for the remaining term of the loan.
3. The prepayment provision is invoked if the borrower prepays or terminates the loan. The borrower collects a fee if rates are higher, but pays a fee if rates are lower.
4. Indicative termination amounts can be quoted by contacting the hedging desk and can be calculated using a simple spreadsheet (available here). The prepayment provision is defined in the Rate Conversion Agreement, and a prepay scenario table (like the one on this page) will be included in each borrower presentation and in the signed ARC Agreement.
5. Borrower's views on rates- If the borrower believes that interest rates will rise or remain steady, this prepayment provision is an advantage.
6. Financing cost neutrality- If rates fall, upon the termination of the hedge, the borrower owes a fee, but that cost would be offset by the savings the borrower will realize by retaining the floating rate or locking in another fixed rate loan for the remaining life at the then prevailing lower rate.
7. Balance sheet financing for borrowers – Using the ARC program, with the bank's underwriting approval, the borrower can blend and extend new money, new term, or new amortization without invoking a prepayment. The borrower can also substitute collateral, bifurcate the loan or a new borrower can assume the loan. No other lending product offers such flexibility (but subject to bank approval).
8. 1031 exchange or assumption – Using the ARC program, without invoking the prepayment provision, a borrower can substitute collateral using a 1031 exchange, or a new borrower can assume the loan and hedge (subject to the bank's credit approval). This is done via a simple amendment to the Rate Conversion Agreement. This hedge portability is not found in traditional ISDA swaps or most conventional loan products.

Subject Loan: A $1,000,000 loan is structured as a 10 year final maturity with a 25 year mortgage amortization, with a 6.000% fixed rate where the initial hedge rate is 4.000%.

If 3 years into the loan, the then current 7 year hedge rate is 25 bps lower than the starting hedge rate and the borrower prepays the entire loan, the borrower will pay $13,506. Partial prepayments work similarly on a proportional basis. However, the borrower and lender will have the option to apply the loan to a new project/ property and the repayment will not apply.

If 3 years into the loan, the then current 7 year hedge rate is 25 bps higher than the starting hedge rate and the borrower prepays the entire loan, the borrower will receive $13,288. Partial prepayments work similarly on a proportional basis.

Initial Hedge Rate:	4.000%
Loan Spread:	2.000%
All-in Fixed Rate:	6.000%

Remaining Term	Prepayment Hedge Rate vs. Initial Hedge Rate						
	-75 bps	-50 bps	-25 bps	0 bps	+25 bps	+50 bps	+75 bps
10 years	(58,061)	(38,274)	(18,924)	-	18,507	36,607	54,311
9 years	(52,801)	(34,840)	(17,242)	-	16,894	33,446	49,666
8 years	(47,005)	(31,047)	(15,381)	-	15,101	29,928	44,486
7 years	(41,185)	(27,233)	(13,506)	-	13,288	26,362	39,225
6 years	(35,332)	(23,388)	(11,611)	-	11,448	22,737	33,867
5 years	(29,452)	(19,518)	(9,701)	-	9,586	19,057	28,417
4 years	(23,538)	(15,616)	(7,770)	-	7,695	15,316	22,863
3 years	(17,635)	(11,713)	(5,835)	-	5,792	11,541	17,247
2 years	(11,739)	(7,806)	(3,893)	-	3,873	7,727	11,562
1 years	(5,862)	(3,903)	(1,949)	-	1,943	3,882	5,815

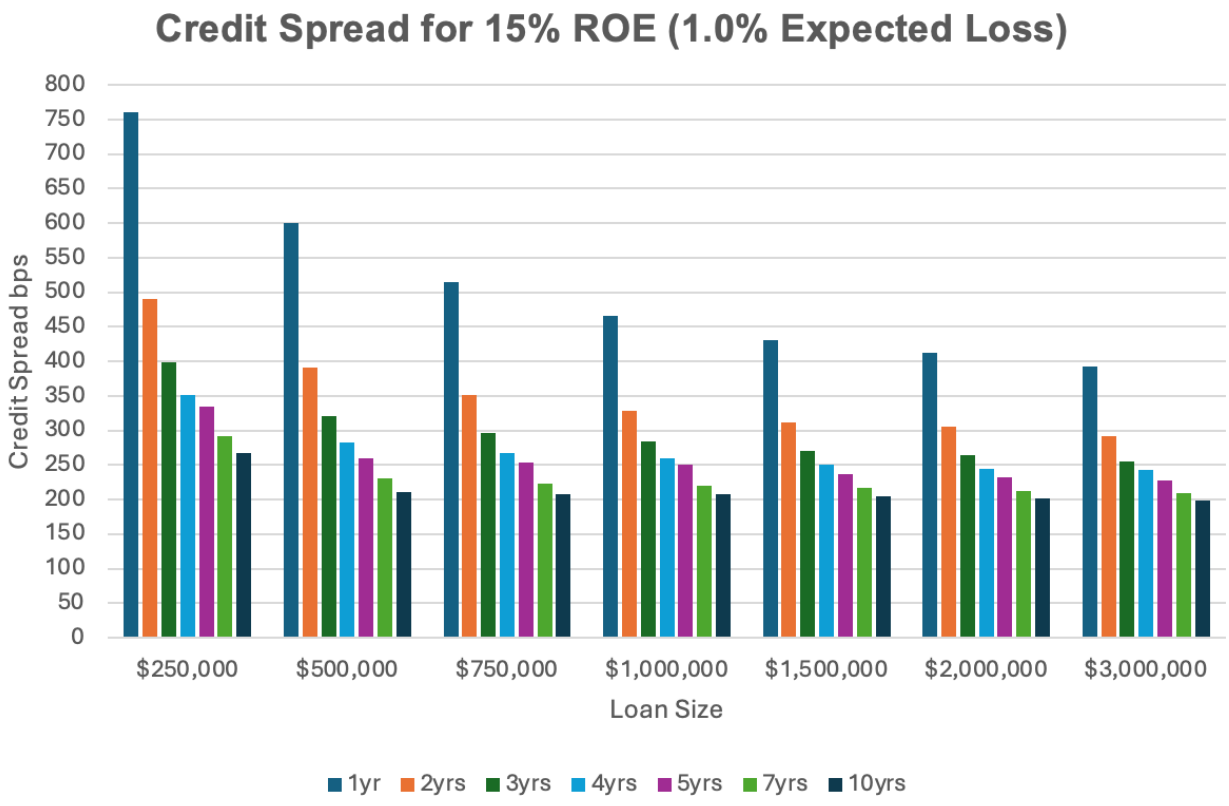
9. Alignment with the borrower's outlook – The borrower is given an option on the term that best suits their business needs. If held to maturity, borrower will not invoke the prepayment provision and may ignore market volatility. Giving borrowers the ability to choose loan terms is a positive differentiator.
10. 1A/B Structure- The loan principal balance is divided into two (or more) loans. Loan A is hedged and subject to the prepayment provision, and Loan B is unhedged, and typically is a shorter-term or adjustable facility, and subject to the bank's standard prepayment provision. The borrower now has the option to prepay Loan B when desired without invoking the SYM. When rates rise, either loan can be prepaid because the borrower would collect a fee when prepaying the hedged loan.
11. Convert to declining balance prepay – Option 1- ARC side agreement, a bank takes the mismatch between the symmetrical prepayment and declining balance payment. Option 2- For larger loans ($4MM and over) the borrower can purchase a prepayment option, but this increases the borrower's hedge rate.
12. Partial term hedge- Loan is hedged for less than the full term. (eg. a 10 year term, a hedge is 7 years, and the bank matches the fixed rate on in-house fixed for the remaining 3-year term)- the post-hedge portion of the loan will have a lesser balance and (presumably) carry a higher probability of prepayment, thereby posing less duration risk for the bank, and those final 3 years do not require a symmetrical prepayment provision.
13. A fully dynamic excel SYM model can be downloaded

3. Pricing grid and relationship between term, principal balance and profitability

Hedged loans at community banks are made for longer terms (recent averages have been around 9-years) and are larger in principal (average of approximately $2.7mm). It is no surprise that a strong causal relationship exists between loan term and size, and profitability as measured by ROA/ROE.

We ran hundreds of loan scenarios to solve for a credit spread to term SOFR that would achieve an acceptable ROE for the average community bank of 15%. Our loan acquisition costs, maintenance costs, cost of funding, deposit beta, and other general variables were set to equal the average community bank profile. We used average credit quality equal to 1% expected loss, loan sizes between $250k and $3mm, and terms between 1 to 10 years on 25-year amortization. We then solved the credit spread required to achieve 15% ROE.

A graph detailing term, loan size, and appropriate credit spread for 1% expected loss is shown below.



Credit quality, loan size, and term all influence ROE for community banks. Loans below $1mm in size disproportionately detract from ROE (and pricing these loans with additional credit spread generally becomes uncompetitive in the market). Terms below three years are also largely unprofitable.

Credit quality of 1% expected loss per annum or "good" corresponds to a typically commercial loan at approximately 1.5X DSCR and 70% LTV. The graph demonstrates that to achieve a 15% ROE, a community banks needs to price a 25 due 5, $250k loan with a 3.35% credit spread. However, the same loan but $3mm size will return a 15% ROE with a 2.28% credit spread. When considering the commitment term, a $1mm loan 25 due 1 requires a 4.66% credit spread for a 15% ROE. However, the same loan but with a 10-year commitment requires a 2.07% credit spread for a 15% ROE.

Banks that use loan hedging to extend loan terms and protect against early prepayments, and that measure instrument-level performance, may recognize higher returns than banks who do not. Bankers that would like access to pricing grids may click here to access such information.

4. Amortization, term and credit exposure

Many bankers would prefer to set shorter maturities for loan repayment terms. The logic is that it is better for the bank to control the credit with a hard stop and revisit credit appetite at shorter intervals. If credit conditions are appropriate, the bank can renew the commitment or re-write the loan, and if credit conditions have deteriorated, the borrower will need to find alternative financing sources. We believe that this logic is deeply flawed and empirical evidence on vintage credit and profitability analysis do not support short-term maturities for banks' credit criteria or ROE goals.

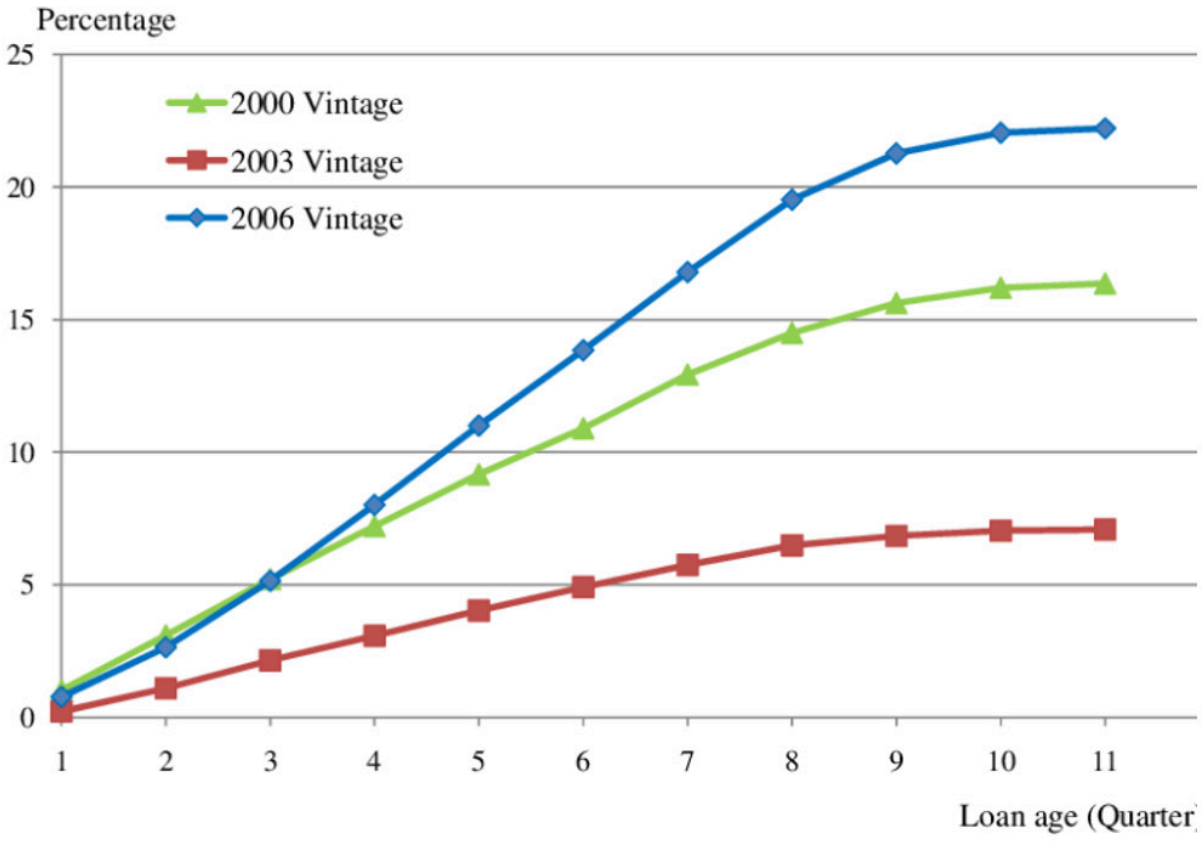
A few important points are worth highlighting:

1. It is inaccurate to assume that if the bank does not want to renew or re-write the loan that another willing lender will step up. Many banks are stuck with maturing credits in a recession.
2. Bank credit officers cannot predict future credit downturns. It is true that a shorter term on a loan will lead to less chance of that specific credit being on the books at the bank during the next recession. However, banks need to replenish loan runoff and maturities. Therefore, that loan with a shorter term that comes to its maturity date will be considered at the bank for an additional term. Many times, the borrower will want to re-leverage and re-amortize that loan. This puts the bank in a worse position than had the loan been originally booked with a longer maturity. At the time of the renewal, if credit has deteriorated banks face the issue outlined in point 1) above, and if credit has improved, the bank has a longer credit facility with the added burden of cash-out and re-amortization, and potentially lower pricing.
3. Most importantly, credit officers are paid to assess credit but not profitability. We will see below that even if longer maturities lead to more credit risk, they may also generate proportionally more revenue, driving up ROE. Many credit officers are simply not attuned to this trade-off and make siloed decisions.

Vintage Analysis

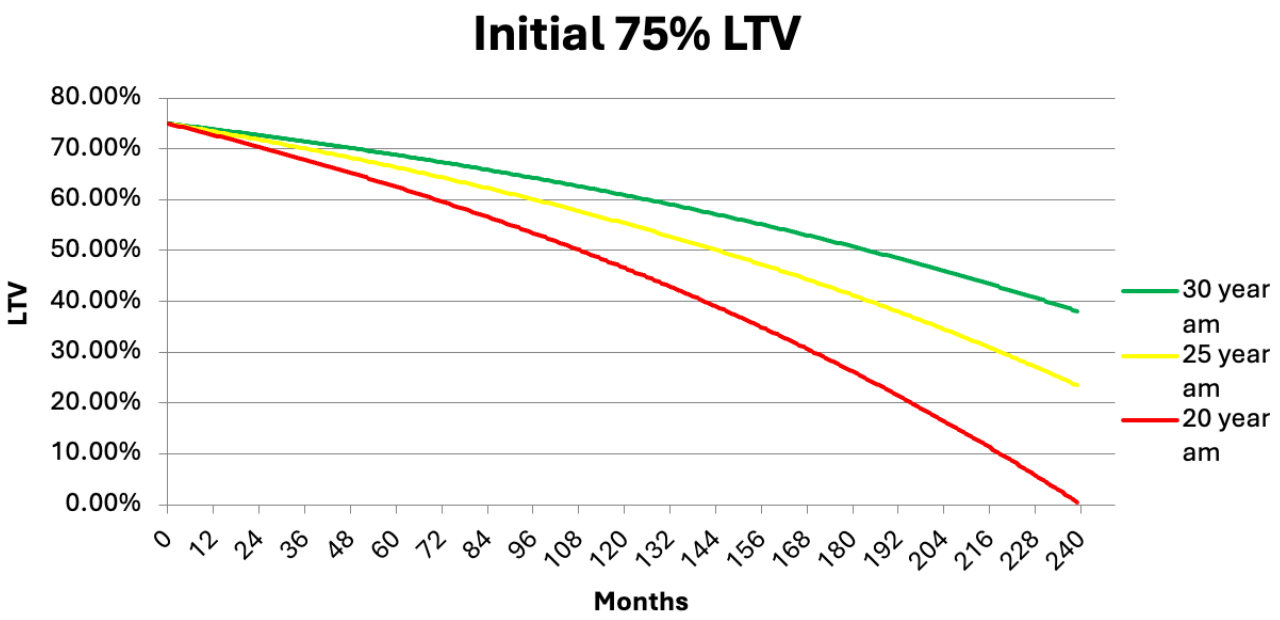
Vintage analysis offers bankers a perspective on the risk and profits of loans based on loan maturation. Vintage analysis groups loans in a specific period and tracks performance through the life of the loan. The pools can be analyzed for delinquencies, payoff trends, losses (typically charge-offs) and profitability. To effectively use vintage analysis, changes in external factors that do not relate to maturation must be controlled. For example, loans originated in 2006 would show credit stress 2 to 4 years later. But that stress would be attributed to the recession that followed rather than the natural maturation of a typical pool. Further, different credit grades within the vintage pool will exhibit different vintage behavior. It is essential to pool loans with similar credit grades.

What is clear in vintage analysis of commercial loans is that average per year loss increase in the first few years and then declines. The rise and decline of per year losses depend on the type of loan, amortizing or bullet, and inherent credit strength. However, the average chart of cumulative default rate is shown below on three vintage loan pools. The credit risk (as measured by default or write-offs) starts low, accelerates, and then flattens again. This pattern is consistent across different loans and periods.



The Importance of Amortization

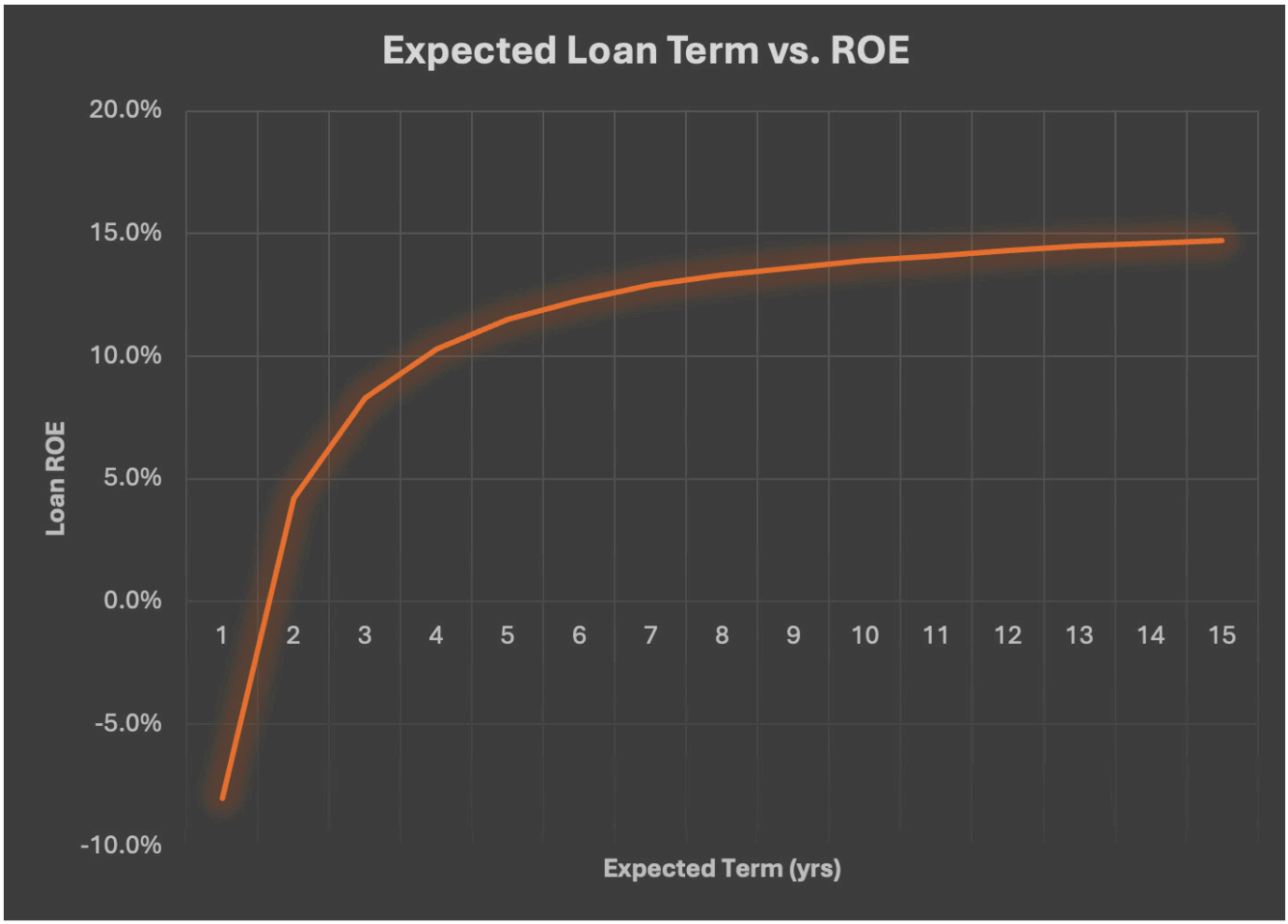
Most commercial loans are structured on a mortgage-style amortization. Under that formula, only a small amount of the loan is amortized initially, and substantial amounts are amortized near the end of the loan. The vast amount of principal reduction never occurs if lenders set balloons before the pivotal point in the loan amortization schedule. Below is a graph showing an initial 75% LTV loan and three different amortization periods (20 years, 25 years, and 30 years). Strictly as an LTV risk to the lender, most of the risk exposure is in the initial term of the loan (1 to 5 years). The graph shows that little amortization occurs until about 5 years into a loan on either a 20, 25, or 30-year am schedule. On a 25-year amortization only 4% of the loan is amortized over the first 2 years, but 27% of the loan is amortized over the first 10 years.



Profitability:

The most important analysis for our discussion is the tradeoff between credit risk and profit. If a longer term resulted in one extra dollar of expected credit loss, but ten extra dollars in profit, every banker would accept the tradeoff as beneficial. But this analysis is not the bailiwick of the credit officer.

Because it is expensive to source, negotiate and book new commercial loans, long-term loans are typically more profitable for banks (all else being equal – including credit risk). Conversely, short-term loans can be a serious drain on bank earnings. The graph below shows the results from our modeling of commercial loan ROE. Because of the high direct and indirect costs of booking a new credit relationship, loans exhibit a negative ROE (risk-adjusted return on capital, or RAROC) in the first year or two and still subtract shareholder value in year three. Commercial loans become more profitable with maturation, and the ROE levels out after 10 years.



Conclusions on Optimal Commercial Loan Terms

Every commercial loan must be considered on its specific merits. For example, a single tenant property, with a 3-year lease expiration, has a strong idiosyncratic credit characteristic. However, the general amortizing commercial loan has a decreasing risk profile after the initial few years, and a strong uptick in ROE after five years. For many credits, and average-sized community bank term loans, ROE is highest in the five-to-15-year term.

5. Framework for loan hedging adoption

The basic premise of bank product management is having the right strategy, in the right channel, for the right product, at the right time, for the right customer, and having it serviced by the right employees. The reason that loan-level hedging makes a good fit for many community banks is as follows:

1. Loan level hedging increases the life-time value of a customer by extending loan duration, increases cross-sell opportunities, and may attract liquid borrowers who may have both credit and deposit product needs.
2. Community banks may not need to hire new product or risk managers, since loan hedges are an addition to an existing product – a commercial mortgage. This makes the product easier and faster to implement.
3. The product is appropriate for longer-term credit commitments because it mitigates both borrower and lender risk, creating certainty of payments for the borrower and stable margins for the lender.
4. The product is an effective way for community banks to generate more non-interest income which is an important profit driver for most banks.
5. Not all customers are the right fit for the product, however, borrowers who want a long-term relationship with the bank, have multiple financing needs, and a need for multiple banking products are both profitable and a good fit for loan hedging.
6. The best aspect of a loan hedging program is that the sales team is already in place at the community bank – the commercial relationship manager or lender. The product also makes the relationship manager more profitable by offering more value to the borrower.

Building a Product Team: For community banks adopting loan-level hedging, the team should include the following managers: a) chief lending officer as the product manager or product champion, b) chief credit officer or chief risk officer as the product risk manager, c) existing marketing team to handle branding, positioning, advertising, and marketing, d) loan operations to handle billing and payments, and e) if a bank has existing profitability analyst, that analyst should be administering fund transfer pricing, RAROC profitability, and loan and deposit level margins. A loan-level hedging product is an adjunct to what banks already manage – commercial mortgages, making the product easier to implement and manage.

Understanding and Establishing the Product: Many community banks are facing competition from larger banks that already offer loan-level hedging. Therefore, many community banks will use the product defensibly to retain existing customers. However, responding and pricing to competition is not always an optimal strategy. Community banks should understand the cost, risk, and reward of loan hedging when setting pricing and targeting customers. Community banks must understand what problems a loan hedge is solving for the borrower, what value proposition the bank is offering relative to competitors (ease of use, ease of maintenance, options for borrowers), the added risk to the customer, and what alternatives are available to the customer.

Developing A Strategy: Community banks want to position loan-level hedging to take advantage of the competition, reach some risk or revenue objectives, or achieve some other goals for the bank. We have seen community banks use the following strategies effectively for loan-level hedging:

1. Certain community banks label their commercial mortgage/hedge as "Turnkey Construction Loan". Where the bank offers a single closing construction with permanent take-out financing, where pricing is fixed at inception. This offers the borrower a reduced pricing risk, but also offers the community bank a longer, and more profitable credit facility.
2. Other community banks have target cash-rich businesses with commercial loans/hedges and offer zero-cost closing. The bank pays for appraisal, title work, and other reasonable closing costs through the hedge fee generated by the product. Depending on the structure, the average closing costs paid by the bank represent only 10 to 25% of the total hedge fees that the community bank can generate from the product.
3. Another strategy deployed by a few community banks in the market, is to position the commercial loan/hedge as balance sheet financing versus project financing. For example, a community bank may call the product "XYZ Bank Portable Financing." The ability to move the loan from collateral to collateral creates substantial value for some borrowers whose business model requires cycling different projects or business, but the consistent theme is that the borrower wants a long-term relationship with the bank. The strategy creates higher loan revenues for the bank (in the form of NIM and fees), higher future upsell business, and opportunities for cross-selling other bank products.

Marketing Plan: If the product is used strictly defensively, a marketing plan may not be required. However, if the product is aimed at winning new business, or proactively converting existing clients, then management needs to create direction and application for a loan/hedge product. Certain community banks with expertise in manufacturing, fishing, government contracting, veterinary practices all utilize the loan/hedge product to retain existing business and win new business by applying the product to existing and well-known customer segments.

Sales Communication and Training: All banks should want to avoid reputational risk associated with a new or more nuanced product, and this is especially the case with loan-level hedging. The sales team (commercial relationship managers and lenders) must be given upfront, ongoing, and customer-facing support to be able to identify appropriate prospects, explain the product, and establish suitability (both the lender and borrower must agree to the product fit). This is where simplicity of the product is key: a well-defined agreement is better than nebulous documents, concise is better than voluminous, and ongoing simple customer maintenance is better than asking borrowers to get involved in derivative accounting.

Support Model: Every product must have customer support, and banks either need to develop the support in-house or through a trusted vendor. Proper internal training, external training content, and outsourced vendor support are key to establishing an effective and profitable loan/hedging product.

Risk Management: Every product can introduce risks that must be managed, and not using a product comes with its own set of risks. The CCO or CRO must understand the additional risk and risk mitigation that a loan/hedge product introduces to the bank's balance sheet. The most essential elements that bank managers must appreciate with the product is trust and reputational risk. If the product is not explainable to the borrower, and if the borrower does not understand the

risks associated, then it should not be sold. The mitigant is that often the loan/hedge product can be tailored to the borrower's timeline and structure, to offset or reduce risk to the customer by controlling terms, dollar amounts, or adding prepayment options.

Hedging tends to increase lifetime customer value, fee income and retention rates, which should be the goal of community banks when identifying new products. For new products, tracking profitability, on a risk-adjusted basis, is also a paramount goal. Compared to many other products, a loan-level hedging program, as an adjunct to a commercial mortgage, is an easier product for community banks to adopt.
.

6. Comparison of profitability between hedged and unhedged loans

Our empirical analysis shows that, on average, hedged loans are more profitable than unhedged loans. We conducted a study of a regional bank with just over $23Bn in funded commercial loans. We reviewed just over 25.5k relationships and compared profits as contribution to overhead adjusted for fund transfer pricing. We removed any relationship that did not contain a funded loan. We specifically wanted to distinguish hedged loans versus unhedged loans and how this one specific product reflected on the bank's profitability. This bank has been offering fixed-rate loans to clients both as hedged loans and fixed on balance sheet.

The table below summarizes our findings. Out of the 25.5k loans, a little less than 5% are hedged loans. However, the hedged loans are on average $3.4mm in size compared to $781k in unhedged loans, and the hedged loans contributed almost 25% of annual profit for the bank. The average hedged loan generated $73.7k in profit – which is 6.4 times the average profit for an unhedged loan.

	Hedged Loans	Unhedged Loans	All Loans
Number of Borrowers	1,221	24,301	25,522
Percent of Borrowers	4.78%	95.22%	100%
Sum of Loans	$ 4,154,648,834	$ 18,994,365,357	$ 23,149,014,191
Sum of Annual Profit	$ 89,927,517	$ 279,050,696	$ 368,978,213
Percent of Profit	24.37%	75.63%	100%
Average Annual Profit	$ 73,651	$ 11,483	$ 14,457
Average Loan Size	$ 3,402,661	$ 781,629	$ 907,022
# of Unprofitable Borrowers	15	5,653	$ 5,668
Sum of Annual Loss	$ (751,432)	$ (61,864,502)	$ (62,615,934)
Sum of Unprofitable Loans	$ 84,287,854	$ 6,569,289,755	$ 6,653,577,609
% of Unprofitable Loans	2.03%	34.59%	36.61%

The important takeaway from the table above is not the sum of the profitability for hedged loans versus unhedged loans but the percentage of the loans in the two groups that generate negative profit for the bank. Of the hedged loans, only 15 were unprofitable for the bank, versus 5.7k unprofitable unhedged loans.

Further, the total sum of unprofitable loan principal outstanding for hedged loans was just 2% of all hedged loans versus 34% for unhedged loans. Stated another way, the bank had $84mm in hedged loans with negative profit, and $6.6Bn in unhedged loans with negative profit. The hedged loans subtracted $751k in annual profit from the bank, but the unhedged loans subtracted $61.9mm in profit. The bank allocated 36.61% of its loans (a proxy for capital) to unprofitable clients. An unintended result that would motivate any management team to reconsider upfront pricing and return analysis.

The graph of all hedged and unhedged loans with annual profitability is shown below. The graph shows very few unprofitable hedge loans (15 in total), and 5.7k in unprofitable unhedged loans, subtracting substantial amount of value (profit) from the bank. This phenomenon requires some further analysis, explanation and discussion.

Why are so many of the unhedged loans so unprofitable for this bank? There are two major reasons that a high percentage of unhedged loans are unprofitable. First, many of the unhedged and unprofitable loans are fixed-rate loans priced in a lower interest rate environment. These loans are now unprofitable because of the bank's higher COF as the result of an upward shift in the yield curve. Second, we measured the profitability per client and the bank's cost of deposit per relationship is a large factor. Some of the unprofitable unhedged loans suffer from high-cost deposits. This second reason also brought down the profitability for some hedged loans.

Some bankers will point out that the unprofitability of this bank's current fixed rate loans was caused by an idiosyncratic event (a sudden shift in interest rates) that is not often repeated. But we believe that this is an incorrect argument. For as long as we have been studying bank profitability, both in up interest rate cycles and down cycles, interest rate risk has been a main culprit in depressing bank profitability. When interest rates rise, fixed-rate borrowers extend their loan duration. When interest rates decrease, fixed-rate borrowers refinance their loans to prevailing lower coupons. In any interest rate environment, banks are disadvantaged without a hedging program. Fixed-rate, on balance sheet loans, become one-way floaters that hurt bank profitability.

7. Benefit of ARC vs. back-to-back swaps

The ARC program is an alternative to a back-to-back swap program used by national banks. It was designed specifically for community banks and offers some compelling advantages for users. Most swap programs are complex and require lawyers, accountants and sales specialists to succeed. ARC is a loan hedging tool that requires no derivative accounting for the bank, no complex derivative documents and no swap settlements for the borrower. What at other banks is a complex product only suited to the very few sophisticated clients, the ARC program democratizes loan swaps for the average commercial borrower. The program is easy for a lender to explain and the borrower to understand. Many community banks tout service as a primary differentiator. The ARC program allows a bank to offer up to 20-year fixed rate loans to commercial borrowers, but the community bank's balance sheet is protected from interest rate risk.

In summary, the advantages to the borrower and the community bank are shown below.

For the Borrower

1) No ISDA
2) No separate settlement statement
3) No derivative accounting

For the Bank

1) No hedge accounting
2) No ISDA docs
3) No capital allocation
4) No collateral flow
5) No Dodd-Frank reporting

Connect with us on LinkedIn

SouthState CORRESPONDENT DIVISION