PRICING AND HEDGING NON-AGENCY LOANS
WITH ERIS SOFR SWAP FUTURES

WHITE PAPER

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In both low and high origination environments, non-agency loans, such as jumbo, Non-QM, and Private-Label Security, are always flagged as potential growth areas for lenders. What has prevented these perennial projected growth areas from gaining steam?

Part of the issue holding back these types of loans from gaining more of a foothold comes down to the classic chicken or the egg causality dilemma. A liquid secondary market begets more production, and more production creates more liquidity in the secondary market. This situation is commonly seen in agency hedging when the market moves quickly, and new originations are slotting to coupons not yet liquid and commonly traded by broker-dealers. Originators must also deal with an opaque price discovery process due to the lack of a liquid secondary market. Could the lack of a trusted pricing strategy be leading to less origination, thus impacting the liquidity of the secondary market for these assets?

The lack of reliable pricing for bulk deals (or even in investor rate sheets) leads to originators using less sophisticated pricing strategies to price new originations that may not be fully grounded in reality. There is some convenience to pricing originations, bulk deals, and securitizations using the "finger in the air" approach of a simple spread over a selected US Treasury. However, this creates headaches for those trying to derive hedging strategies for short-term warehousing and longer-term investment strategies. If you cannot reliably and confidently price a loan, how can you hedge it with confidence? The flip side is that many vendors can supply complicated models with a great deal of flexibility, but the number of options and lack of tried-and-true strategies can leave lenders overwhelmed with too many options. Z-spreads, stochastic rate paths, Option Adjusted Spread (OAS), N-Spreads, and other modeling complexities add additional anxiety to this process.

If you made it this far, you may still be wondering what you can use to hedge these loans. Unfortunately, there isn't a liquid jumbo forward contract available, like there is in agency originations. You could use Treasuries, but in addition to not having an embedded credit component, there is no way to build a tradable, forward term structure – a key component to financial modeling and loan pricing. It is unfortunate that U.K. regulators phased out LIBOR in June 2023, as it used to have a credit component with the capability to build a tradable, forward curve based on LIBOR swaps. Although to-be-announced (TBA) agency securities might seem appealing, despite their poor liquidity ever since the Federal Reserve stopped buying agency mortgage-backed securities (MBS), the risk characteristics of TBAs are not suited to pricing and hedging non-agency loans.

So how do you build a liquid and tradable forward rate curve to use when pricing and hedging loans? The answer lies in LIBOR's replacement, the Federal Reserve's Secured Overnight Financing Rate (SOFR). While SOFR does not represent the same unsecured bank credit that LIBOR once displayed, most U.S. dollar funding is now based on SOFR, so it does reflect the market's availability of balance sheet, which is more useful than Treasuries in hedging pure interest rate risk. Due to the lack of a liquid secondary market, most non-agency loans are also held on balance sheet where they are financed using SOFR-based funding. Additionally, there is now a deep, liquid market in SOFR swaps with exchange listed SOFR instruments available that make it easy and cost effective to trade SOFR. With SOFR-based financing and valuation models now built using SOFR rates, the most efficient hedges are trading SOFR rates.

INTRODUCING CME GROUP'S ERIS SOFR SWAP FUTURES

Derivatives trading is the lifeblood of financial hedging. Derivatives, principally SOFR swaps, are off-balance sheet contracts, meaning they do not require a funding leg to the transaction. These derivatives allow users to transform their interest rate risk, thus mitigating the price risk of portfolio values due to changes in interest rates. Since the global financial crisis, access to derivatives has become cumbersome and expensive to meet compliance due to new rules mandating central clearing and how swaps are traded. Fortunately, CME Group and Eris Innovations created a solution to this problem with the launch of Eris SOFR Swap futures. These futures have been listed and trading as CME Group-listed futures contracts since October 2020.

Rather than taking the often lengthy and always more expensive route to set up for trading traditional bilateral or centrally cleared OTC swaps, CME's Eris SOFR Swap futures contracts are SOFR swaps made available in CME-listed futures format. In doing so, they offer anyone – large institutional players or smaller users – an easily accessible, simple, liquid, and cost-effective way to trade SOFR swap risk. Users traded over $130 billion in Eris SOFR volume in 2023, and this is projected to grow further in 2024 and beyond, given the increased user base and additional liquidity unlocked by margin efficiencies introduced by CME Group.

Key benefits of CME's Eris SOFR Swap futures:

+ Eris SOFR is an easy and cost-effective way to trade SOFR swaps, requiring only a standardized futures account setup and minimal onboarding paperwork – anyone with a futures account can trade Eris SOFR.

+ Contracts trade in $100,000 notional contract size units, allowing for the fine-tuning of hedge sizes.

+ Eris SOFR offers transparent pricing and liquid markets – users can monitor live markets at www.ErisFutures.com/Live.

+ Users obtain efficient access to SOFR swap liquidity from the wider swap market because Eris SOFR contracts net with cleared swaps. This allows market makers, who provide the liquidity, to hold Eris SOFR, and the equivalent cleared swap, with very little capital outlay due to CME Group's efficient margin offsets. This also ensures Eris SOFR prices are anchored to SOFR swap prices in the wider market.

+ As listed exchange traded futures, Eris SOFR contracts benefit from 60 – 70% less initial margin (performance bond) than equivalent cleared swaps. For example, a $1 million, 5-year Eris SOFR hedge position requires around $11,250 of initial margin, while the equivalent swap requires $32,500 of initial margin (rates set by CME Clearing and subject to change).

+ Live and daily 3 p.m. ET closing Eris SOFR yield curves are available to use in hedgers' portfolio risk management systems. This access allows users to price portfolios with instrument prices used to hedge these portfolios, ultimately minimizing SOFR-model to SOFR-market slippage.

+ Lastly, for long-term asset management of retained assets, Eris SOFR contracts do not require quarterly rolling. If the risk being hedged shortens in tenor over time, the Eris SOFR hedge can be held off-the-run, allowing exposure and hedge to age conveniently together.

HOW DO WE OPERATIONALIZE AN SOFR-BASED PRICING AND HEDGING STRATEGY FOR NON-AGENCY LOANS?

Step 1: How can originators price non-agency loans incorporating Eris SOFR Swap futures?

For this step, we assume that all financial models have been converted to SOFR-based. Therefore, if we aim to leverage the benefits of Eris SOFR Swap futures while ensuring internal consistency in pricing and hedging, it is essential that the pricing curve in our model aligns with the Eris SOFR prices we intend to trade.

We will use the end-of-day par rates (based on Eris SOFR Swap futures) published by Eris. Although these Eris SOFR rates are not significantly different from market SOFR rates, utilizing the Eris SOFR rates helps prevent the error of pricing to a SOFR curve you do not trade.

To create a defensible pricing and hedge strategy, use the Eris SOFR curve plus a commercial-grade model that:

+ Incorporates daily Eris SOFR-based term structure

+ Utilizes cash flow-based loan level valuation incorporating multiple points on the yield curve for specific assumptions

+ Integrates with commercial-grade prepayment model, including non-agency specific prepayment and credit projections

+ Includes updates to rate information from a reputable source for non-agency loans (e.g., Optimal Blue Mortgage Market Indices)

+ Contains rate modeling components allowing for detailed G/L attribution, such as mortgage-swap basis, primary-secondary spread, non-agency conforming spread, and more

+ Incorporates the appropriate suite of risk metrics to derive your hedging strategy (your hedging approach should align with how you price to minimize basis risk)

Step 2: How do we know what instruments to use to hedge non-agency loans?

For the remainder of the white paper, we will elaborate on the results of an example $130 million non-agency pool of loans to help determine a suitable hedge strategy, along with subsequent performance tracking. To hedge the exposure of these loans against multiple points on the yield curve, a commercial-grade model should be able to isolate the sensitivity of a loan to a particular point on the yield curve (i.e., key rate duration).

In our fictitious non-agency portfolio, we have exposure to the 2-year, 5-year, and 10-year SOFR tenors. This is due to certain assumptions, such as our discount rate and rate model. The sensitivity produced should be directly linked to a model assumption. The total sensitivity of our portfolio of loans is $37,000 in DV01 or, in other words, for every basis point (bps) move in rates, our valuation is expected to change by $37,000. By selling $130 million (1,300 contracts) of 2-year Eris SOFR (CME code: YIT) and selling $100 million (1,000 contracts) of 5-year Eris SOFR (CME code: YIW),

while additionally buying $40 million (400 contracts) of 10-year Eris SOFR (CME code: YIY), the total exposure is brought down from $37,000 to just $250 of DV01. This is a 99.3% hedge (1-(257/37,356) = 99.3).

	2 YR DV01	5 YR DV01	10 YR DV01	TOTAL
Non-Agency	39,107	8,540	(10,301)	37,346
2 YR ERIS (130M)	(24,178)	(931)	-	(25,109)
5 YR ERIS (100M)	(27,278)	(19,534)	(385)	(47,197)
10 YR ERIS (40M)	11,190	14,061	9,966	35,217
TOTAL	(1,159)	2,136	(720)	257

Step 3: How effective was the hedge strategy?

Hedgers must determine their risk tolerance threshold – that is, how often they should rebalance their hedge to align with their key rate durations. As the market fluctuates, the key rate durations will change, and, in this instance, striving for perfection can be the enemy of great. It is essential to recognize that additional hedge costs can cut margins. In this example, we will use a 5% risk tolerance to trigger a rebalance. In other words, we will not adjust our hedge unless its effectiveness falls below 95% or exceeds 105%.

Using this risk tolerance, we would have to rebalance three times during January, adding an additional ~$20 million of swap futures. The total profitability for January was $70,000, resulting in an 88% effective hedge strategy.

DATE	HEDGE EFFECTIVENESS	SOFR RATE CHANGE	TOTAL G/L	TRADES
1/2/2024	99.32%	0.06	(1,838.32)	
1/3/2024	95.32%	-0.02	434,980.90	
1/4/2024	97.43%	0.10	108,795.39	
1/5/2024	95.58%	0.04	(17,696.62)	
1/8/2024	92.72%	-0.01	246,286.84	Sold 6.5M 5 YR ERIS
1/9/2024	101.54%	0.01	163,729.87	
1/10/2024	103.46%	0.01	(152,141.76)	
1/11/2024	103.99%	-0.06	(237,213.65)	
1/12/2024	105.60%	-0.04	(113,411.32)	Bought 11M 2 YR ERIS
1/15/2024	101.93%	0.00	(124,357.18)	
1/16/2024	101.97%	0.11	(124,357.18)	
1/17/2024	99.33%	0.05	(168,254.73)	
1/18/2024	93.73%	0.04	263,413.71	Sold 5M 5 YR ERIS
1/19/2024	98.00%	0.02	284,163.95	
1/22/2024	100.47%	-0.04	(43,902.12)	
1/23/2024	100.90%	0.04	54,938.94	
1/24/2024	102.06%	0.04	(195,021.15)	

| DATE	HEDGE EFFECTIVENESS	SOFR RATE CHANGE	TOTAL G/L	TRADES
1/25/2024	97.84%	-0.05	106,066.52	
1/26/2024	103.25%	0.02	(227,777.23)	
1/29/2024	102.02%	-0.07	(169,087.33)	
1/30/2024	102.64%	-0.02	12,809.73	
1/31/2024	102.66%	-0.10	70,671.19	

Step 4: What do we do now?

Beware of anyone who promises 100% hedge effectiveness; because there is no "perfect hedge" until there is a completely liquid non-agency secondary market. Even agency eligible loan hedgers struggle to achieve 100% hedge effectiveness with a very liquid TBA market. It is good to make money, but we should understand why. A good commercial whole loan model allows you to track, in parallel, what happens if you tweak certain scenarios such as yield curve twists (non-parallel yield curve moves), the impact of mortgage swap basis, and the impact of conforming-jumbo spreads to further explain the "whys."

The yield curve steepening in January (up 12 bps) significantly contributed to the positive performance. However, our hedge incurred losses due to the negative impact of the mortgage swap spread (which decreased by 15 bps) and the conforming jumbo spread (which decreased by 7 bps).

We can reincorporate the observed impacts into the model as spread regressions to assist in pricing and hedging the next batch of loans. To further minimize the impact of the mortgage swap spread, hedgers could blend TBA and SOFR (in the form of Eris SOFR Swap futures). It is important to note that this sample size is small, and performance can vary based on particular interest rate environments. A commercial-grade model with this type of data reporting essentially becomes a feedback loop with the right hedge and pricing policy that leads to consistently better performance over time.
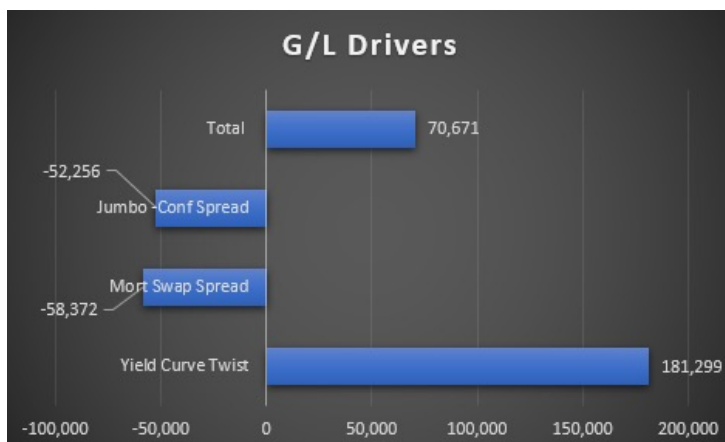
ABOUT THE AUTHOR

Mike Vough is vice president of hedging and trading products at Optimal Blue. In this role, Mike is responsible for managing the product development cycle of pipeline risk management, loan buy- and sell-side tools, mortgage servicing rights (MSR) valuations, whole loan valuations, and lead generation software. Mike also serves as an advisor to some of the largest lenders and servicers in the country on critical functions such as MSR valuation, pipeline risk management strategies, hedging strategies, technology, and pricing/loan sale strategies. Mike joined Optimal Blue in 2021 following the company's acquisition of Compass Analytics. At that time, he served as the product manager of Compass's suite of MSR products and advised many servicers, investors, and MSR brokers on how to leverage Compass's MSR model and general MSR strategies. Prior to that role, Mike worked on Compass's trading desk providing strategic and tactical advice to a number of lenders, including hedging, position management, profit and loss reconciliation, hedge cost, and margin strategy. Mike earned his Bachelor of Science in finance from the Pennsylvania State University.

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READY TO GET STARTED?

Contact Optimal Blue today to begin implementing these best practices into your hedging and trading strategies.

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