Happy Farming: How Loopers Get Squeezed

Joe Wait ✓
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In this edition of **Happy Farming**, we explain the dynamics of DeFi looping. We'll see how rates, price, and duration can interact to produce an awful squeeze for loopers. At the end, we suggest some tools to help you manage risk and loop better.

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1. Swap WETH for wstETH
2. Supply wstETH as collateral
3. Borrow WETH
4. Repeat steps 1-4 to reach the desired leverage

Here's how our collateral and debt positions look with each loop if we borrow at 88% LTV:

Looping wstETH-WETH 7x at 88% LTV (1 WETH = 0.8156 wstETH)

Instead of receiving just 2.5% staking yield on 0.81 wstETH, we now earn that rate on 7.1 wstETH. We've multiplied our annual

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Net yield on wstETH-WETH 7x position

Taking account of our costs we expect to make 5.26% net profit annually, more than double what we would get by just holding wstETH.

Sounds great - **what's the catch?**

Spread

Loopers make money by **exploiting a spread** between the yield rate on their collateral asset and the borrow rate on their debt asset.

This chart shows the daily average @aave V3 WETH borrow rate against @LidoFinance stETH staking yield for the past 180 days:

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However, this carry has recently flipped deeply negative.

If the borrow rate rises above the yield rate, we now have **leveraged exposure to a net negative return**. The value of our debt relative to our collateral will increase rapidly, eroding the health of our position and putting us at risk of liquidation.

This can also happen the other way around, where the borrow rate remains constant but the yield decreases. The effect is the same - our position begins bleeding and our LTV increases as we eat the losses.

When returns flip negative, **loopers are forced to unwind**.

In theory, unwinding sounds simple:

1. Withdraw a little wstETH collateral
2. Swap wstETH for WETH
3. Repay a little WETH debt
4. Repeat until all debt is repaid and our initial wstETH equity can be withdrawn

Assuming the wstETH -> WETH price is the same or better than

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price of ETH. Our goal is to **remain neutral on the ETH price whist maximising yield**.

By borrowing WETH against wstETH, we ensure that our debt and collateral values are correlated. As wstETH is a yield-bearing form of ETH, we might expect that the value of our collateral asset could only ever increase relative to our debt. But this would be wrong.

Whilst it's true that the amount of ETH which wstETH can be redeemed for increases monotonically, the **market price of wstETH<>ETH can deviate** from this redemption value, as the following chart shows:

wstETH/ETH 24hr MA Pyth market price vs Redemption Rate

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our whole position at risk. Thankfully, lenders such as Aave and @Morpho use oracles which values wstETH at its redemption value under normal circumstances. However, if the market discount exceeds a certain threshold these oracles can begin taking account of the market price, putting our position at risk.

If you want to read more about LST oracle pricing, check out the research from @LlamaRisk:

LlamaRisk @LlamaRisk · 3 Oct 2024

LlamaRisk's latest research examines Liquid Staking Token pricing in DeFi lending protocols. Incorrect LST pricing, whether using internal or market rates, can threaten protocol solvency and create bad debt. Dive into the critical risks and implications for DeFi lending 👇

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One driver of the wstETH discount is the spread between WETH borrowing rates and the stETH yield rate.

Yield compression and the rise of managed vaults have **turned looping into an industrial-scale phenomenon**, as asset managers take on leverage to squeeze our a few basis points and remain competitive.

When borrow rates shoot up and spreads flip negative, the most highly levered loopers begin unwinding. A deluge of wstETH hits the market, depressing the price. The widening discount and can trigger a **cascade of unwinds**, as other loopers head for the exit not wanting to be the last one out the door.

We can observe this relationship between rates and the discount in the following chart, which plots the Aave V3 WETH borrow rate against the wstETH market discount. Note how the recent **negative spread correlates with the wstETH discount**:

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The market values optionality - an asset which redeems in 7 days will always be worth more than an identical asset which redeems in 14 days, especially when no yield can be earned during that period.

We can observe this relationship in the following chart, which plots the withdrawal queue against the wstETH discount. Note how the **discount has closed as the queue length has shortened**:

Beacon chain withdrawal queue vs wstETH discount

In terms of which has the biggest influence - rates or waits - my analysis leans in favour of the **withdrawal queue length being a better explanatory variable** for the wstETH discount than the carry spread (R^2 of 10% vs 2%). However, neither alone explains

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Correlation analysis of carry spread and withdrawal queue vs wstETH discount

Squeeze

These three factors - price, rates, waits - can **combine into a deadly squeeze**.

Imagine the situation:

- A large ETH validator decides to exit, causing the withdrawal

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- As the discount reaches a critical threshold, oracles now begin pricing wstETH collateral at market value

Not only is the negative spread eroding your position health block by block, but the wstETH price discount is also bringing you even closer to max LTV.

POV: You are caught in a squeeze

You're stuck between a rock and a hard place. If you stay in the position you risk eating negative carry and potentially being liquidated. But if you exit, you'll realise a huge loss by swapping wstETH for WETH at bargain prices.

Executing a panicked unwind in a distressed market also presents significant risks. The first step involves removing some wstETH collateral, which immediately raises your LTV and leaves you exposed until you've swapped to WETH and repaid your

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I wish I could offer an easy solution to how you can avoid falling into such a situation, but unfortunately there isn't one.

TANSTAAFL

You won't make 2x the staking rate without taking on risk. If you plan on doing so, you need to understand those risks and have a plan for managing them. I hope this article goes some way to helping with that.

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The best advice I could give to retail holders looking to optimise their yield is - **leave it to the professionals**. By depositing to @EmberProtocol vaults, you can get exposure to sophisticated strategies like looping without the complexity and risk of having to manage it yourself.

But if you insist on looping yourself, there are some tools that can help you.

Looping Tools

E-Mode

Efficient Mode is a special feature on Aave V3 which allows for borrowing at a higher LTV on selected pairings of correlated assets.

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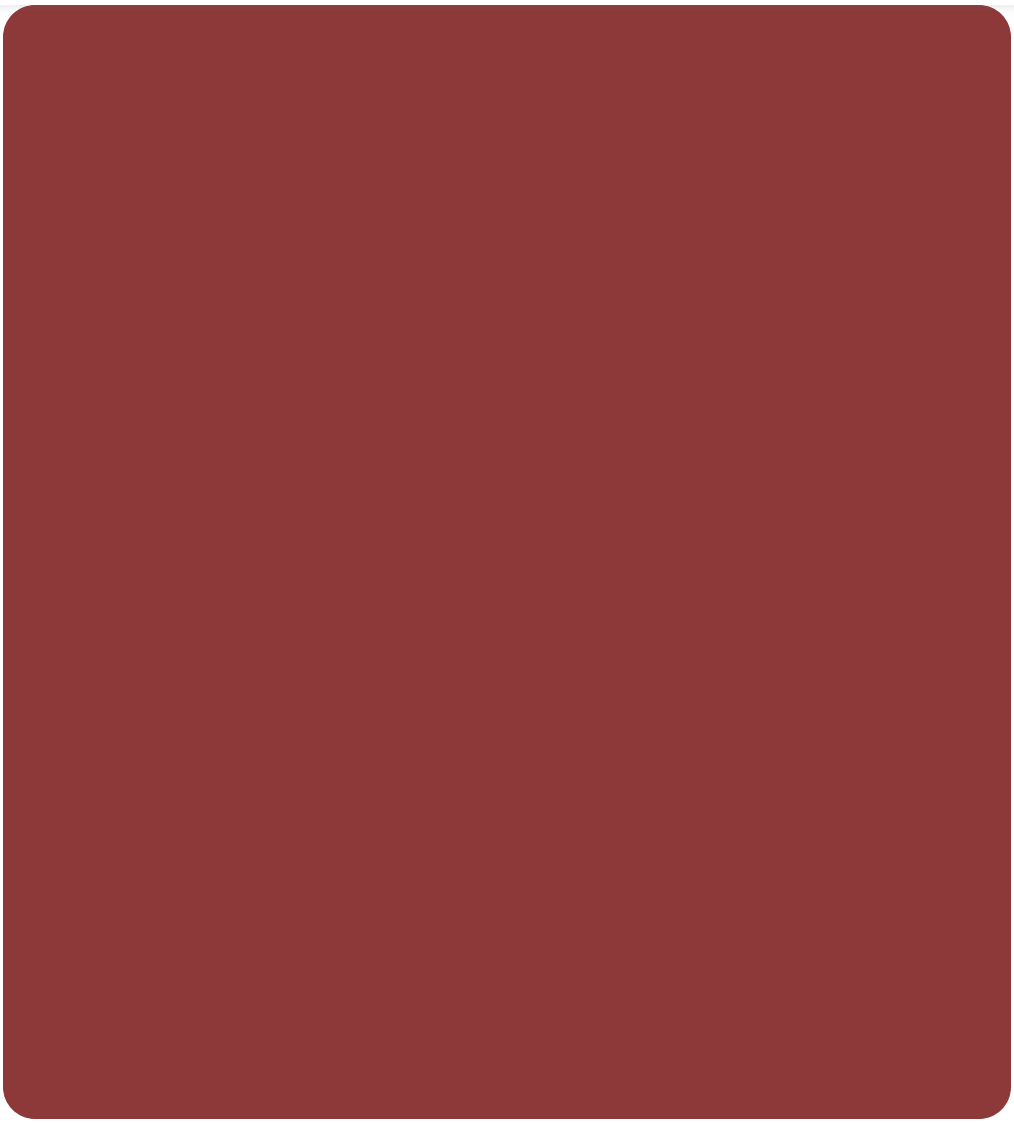

ETH correlated E-Mode

For example, wstETH normally has a max LTV of 85%, but in ETH Correlated E-Mode you can borrow WETH against wstETH at

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Morpho Blue wstETH-WETH 94.5% LTV market

This results in some tailor-made looping markets, allowing you to borrow WETH against wstETH up to 94.5% LTV.

Similar to E-Mode, **isolated markets allow for greater efficiency** but restrict what can be supplied or borrowed. As these markets are permissionless, you must always DYOR and check the oracle that's been configured.

Auto-looping

Manual looping is really annoying. In our example, it took 15 loops to reach 7x leverage - that could require 60 transactions or more. Imagine trying to unwind in a hurry?

@Contango_xyz and @DeFiSaver both provide looping automation to allow you to **enter, exit, and manage positions in**

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Contango's simplified looping interface

Both services charge fees, so you should factor this into your trade setup and consider if it's worth it for you.

Other Assets

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exploit a positive spread between reUSD borrow and crvUSD supply rates.

Joe Wait @JoeWaitOfficial · 23 Jan

Get paid to borrow - get paid more to loop?

Here's how @ResupplyFi x @CurveFinance makes it possible.

Resupply lets users borrow reUSD against crvUSD liquidity provided to a Curve Lend market. Now that the crvUSD-sreUSD lending market has been onboarded to Resupply, it's Show more

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Joe Wait @JoeWaitOfficial · 9 Feb

How to make money from the crvUSD depeg:

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Each looping trade has its own risk profile, so its important to understand the dynamics at play and not just look at headline APY numbers.

Conclusion

In this article, we've covered the basics of how looping strategies work in general, and explored some of the specifics of wstETH looping.

We've seen how price, rates, and waits can interact to change the risk profile of a wstETH loop. These factors can combine into a perfect squeeze, forcing loopers to unwind at a loss or face liquidation from rising rates and collateral discounts.

We've also suggested some tools to help you manage your looping trades, including simply leaving it for the professionals at @EmberProtocol.

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