Juiced - A Basis Yield Farm on Solana

Juiced Team

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1 Introduction

On centralised derivatives exchanges, products have a funding rate to incentivize trades that push the derivative product's price into the direction of the underlying spot price. This mechanism attempts to keep the derivative price as close to the spot price as possible. Sophisticated traders and hedge funds farm these rates for a risk-free return. However, such strategies require constant monitoring, timing and optimal execution thus retail and non sophisticated traders cannot reliably take advantage of them. With the advent of DeFi on Solana, it is now possible for decentralised permissionless finance at high speeds, creating an opportunity to execute a funding rate farming strategy for the everyday investor. Juiced aims to be a decentralised investment platform built on Solana that executes this funding rate arbitrage for its users.

With the recent launch of Mango Markets, the Solana DeFi ecosystem now has an exchange that facilitates the trading of derivatives. This has created a plethora of novel trading strategies that can be executed including the funding rate arbitrage (a.k.a basis yield farming). Farming the basis yield of derivatives on Mango Markets helps to increase efficiency of the market as high funding rates make holding derivatives more costly for the end user. We will now discuss how Juiced will implement and execute this in the most optimal manner for its users.

2 Implementation

On the surface, Juiced will look and interface like any other yield farm or staking pool. Users will deposit their holdings into these pools and obtain interest on their investment. Let's discuss how the Juiced pools (named Cartons) will work under the surface.

2.1 Cash and Carry

The core of the Juiced protocol will execute a cash and carry trade on-chain. Such trades work by exploiting price discrepancies between the spot pricing of an asset vs its derivative price. Let's work through an example trade Juiced would perform on chain for its users. The initial scenario for an investor called Bob looks like this:

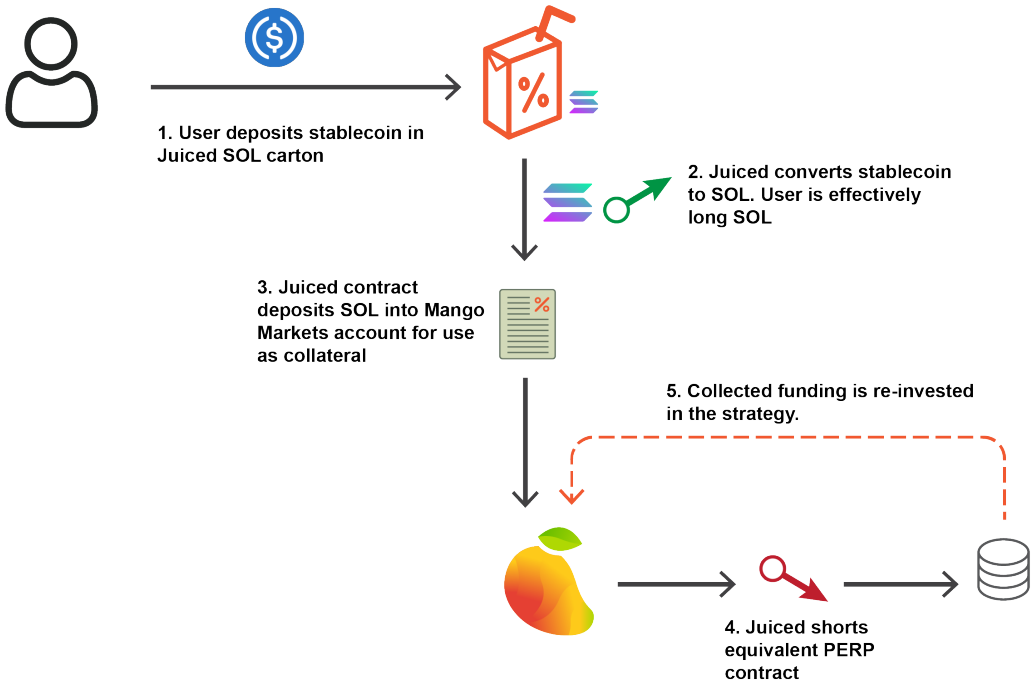


Figure 1: Flow diagram for a user depositing a stablecoin into the Juiced SOL carton

- SOL-USD perpetual swap on Mango markets is priced at 150 USD and is paying an annualised funding rate of 30% (i.e. short position holders earn this rate). *Note: this funding rate is for the purposes of example only*
- SOL-USD spot is also trading at 150 USD.
- Bob currently has 1500 USDC staked in a stablecoin farm earning 10% APR but has decided to deposit it in Juiced as he would like juicier yields.

Once the USD is deposited into the SOL Juiced Carton the following would take place.

- Juiced converts the user funds to SOL, the user then has 10 SOL.
- The Juiced contract deposits the 10 SOL into a Mango markets account to use as collateral on the exchange.
- Using the SOL collateral, Juiced shorts 10 SOL-USD perpetual swaps.
- As the funding rate is collected the Juiced protocol auto-compounds it back into the strategy

Since Bob has a Long spot positions and Short derivatives position of the same notional value of the same asset, their overall portfolio position is delta neutral, meaning the portfolio value does not change even if the SOL-USD price does. For example if SOL-USD goes up to 200 USD, the users Long spot position of 10 SOL would now be in a profit of 500 USD $= [(200 - 150) * 10]$ USD, whilst their Short perpetual swaps position would be in a loss of 500 USD $= [(150 - 200) * 10] * -1$. Therefore as Bob's portfolio value is fixed in USD as soon as they deposit funds into the Juiced carton, the only yield they will accumulate

is the funding rate which is annualised at 30% APR, three times greater than the original stablecoin farm rate.

A discerning reader at this point might question why they need a protocol like Juiced to automate this for them when they could simply execute this trade themselves directly. However this isn't as trivial as it seems in the simplified example above. The following issues may occur:

- Depending on how the derivative is margined, the user may have to maintain some USD balance.
- The user may implicitly borrow the settlement currency to make up for losses in the derivative.
- The leverage can change depending on how the exchange has collateralized the users position.

In the given example where SOL increases in value to 200 USD, the user would incur a USD borrow of 500 USD from their loss in the derivative. This would incur a borrow cost and increase leverage, meaning the protocol may have to adjust the position. Juiced provides automates the management to handle such scenarios so that users can deposit funds into it just like any other yield farm.

2.2 Capital Rebalancing

Juiced can take the cash-and-carry trade even further to help users increase their gains. Since on-chain markets like Mango allow leverage, all of the capital does not need to be kept on the exchange itself. We can then put this excess capital in a yield farm to enhance the users returns. Following the cash-and-carry example,

- SOL-USD perpetual swap is paying funding at an annualised rate of 30%.
- The user sells 1 SOL-USD perpetual swap and buys 1 SOL as collateral.
- The user withdraws 0.8 SOL to a stable SOL farm yielding 20% APR, netting an additional 16% a year yield.
- The stability of the pool ensures that the user doesn't experience impermanent loss (which can actually be very much permanent).

The above trade requires a higher degree of active management of the positions - if one starts losing money on the perpetual, capital must rapidly be moved from the yield farm to the exchange to satisfy margin requirements. In addition to the above, Juiced will be able to automatically rebalance capital between various trades as rates and markets change. If on a particular day, the cash-and-carry-farm trade in SOL is returning less than in BTC, the Juiced protocol can rebalance funds from SOL to BTC until the rates equalise.

3 How Solana and Serum enabled Juiced

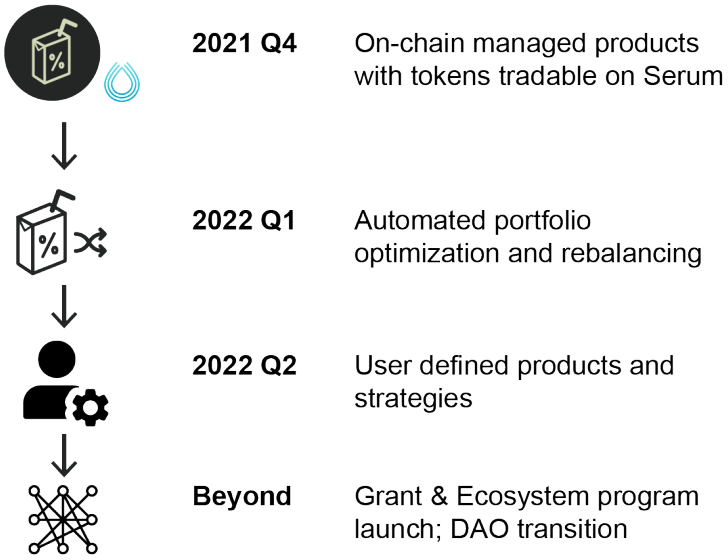
3.1 Transaction Speed

In times of market stress, Juiced requires the ability to move capital from one location to another quickly and robustly. As a result of Solana's sub-second block times, Juiced will always be able to move capital to where it's required. It is not unheard of for coins to move multiple percent in a matter of minutes. In such times, chains tend to clog up and slow down to a point where transactions may take a matter of minutes to complete (without paying significant fees). If one were to try and build Juiced on a slower blockchain, their pools would be at serious risk of liquidation if transaction times were slow to the point of having to endure significant market movements whilst waiting for transactions to complete.

3.2 Order Books

Juiced will continually adjust positions as markets move. If Automated Market Makers (AMMs) were the only source of liquidity, Juiced would be forced to take liquidity and pay high taker fees (often in excess of 30bps+) creating a significant and unwanted levy on the protocol. However, Serum and Mango operate with limit order books to passively provide liquidity just on either side of the order book. This permits Juiced to passively trade while collecting the spread and rebates. Not only does this help Juiced, it improves the quality of DeFi markets in Solana by introducing a greater flow of volume.

4 Timeline



5 Team

The Juiced team are decentralised and based worldwide, we have a range of financial, technology and cryptocurrency industry experience, with some of our team having worked at companies including Alameda Research, Hudson River Trading, Two Sigma and JP Morgan.

So long, and thanks for all the Juice.