The Beginning of DeFi and Birth of Stablecoins

As crypto markets have created massive amounts of wealth via networks and ecosystems that defy traditional logic, a few questions have persisted: how do you take profits? What is crypto wealth measured in? How do we store value on crypto rails?

The volatile nature of cryptocurrencies make it difficult to hang on to your gains unless you are holding a price-stable asset, thus, a crypto-native solution was required. Dollar-denominated (one token is worth $1) stablecoins are needed for a few reasons:

- Crypto as a payment solution
- Holding wealth in crypto
- Earning stable income on crypto
- Buying/selling crypto assets

And thus, stablecoins were born: crypto assets that hold a constant value of $1.

Early centralized exchanges mainly saw users swapping directly between crypto and fiat currency. Most transactions were simply based around buying crypto assets low and selling high for a profit.

But the advent of DeFi and a world of on-chain activity brought a new pile of questions to the table. How do you lock in gains on-chain, withdraw into fiat to use in the real world, and move a constant amount of money from point A to point B?

In this report, we're going to discuss the windy road of stablecoins, its current state, and where it may lead in the future. There is a lot to cover, but we see it as a *necessity* to fully comprehend the stablecoin environment, as it is one of the **most critical aspects to the long-term trajectory and survival of crypto.**

How Stables Come Into Reality

To start this journey, we'll begin with the first stablecoin, USDT, and its largest competitor, USDC. These dollar denominated stables are pegged to the US dollar simply by holding a reserve of assets at a 1-to-1 ratio to stablecoins.

1 USDT can always be minted for $1, 1 USDT can always be sold for $1 of cash. Thus, the stablecoin will always have a static price. Although these stablecoins were the first solution to the serious needs outlined above, there were two major points of concern:

1. Centralization
2. Reserve-based collateral

Tether ($USDT)

Tether issued the first major stablecoin, USDT, allowing anyone with a wallet address to send and receive USDT with no intermediary. In the realm of censorship, this was a huge development for crypto, as people could financially interact with one another across borders and in a permissionless manner.

Each USDT on the market, Tether claims, is backed one-to-one with something equivalent to US dollars. This must be true in order for people to be able to exchange their crypto money into real world dollars, as USDT currently cannot be used in our day-to-day lives. If the reserve assets of USDT are less than outstanding USDT tokens, some people would be left holding a worthless asset if everyone were to liquidate into dollars.

And although this **needs** to be true for USDT to properly function, the waters are murky on exactly what types of assets are backing the stablecoin. Tether has had an ongoing regulatory battle with the New York state attorney general surrounding

transparency of its reserve. This topic is critical to the crypto markets, as USDT is currently the third largest crypto by market cap, clocking in north of $80 billion at the time of writing.

After much scrutiny, Tether began releasing reserve reports to provide more clarity into the stablecoins backing. Here is the current state of the reserve:

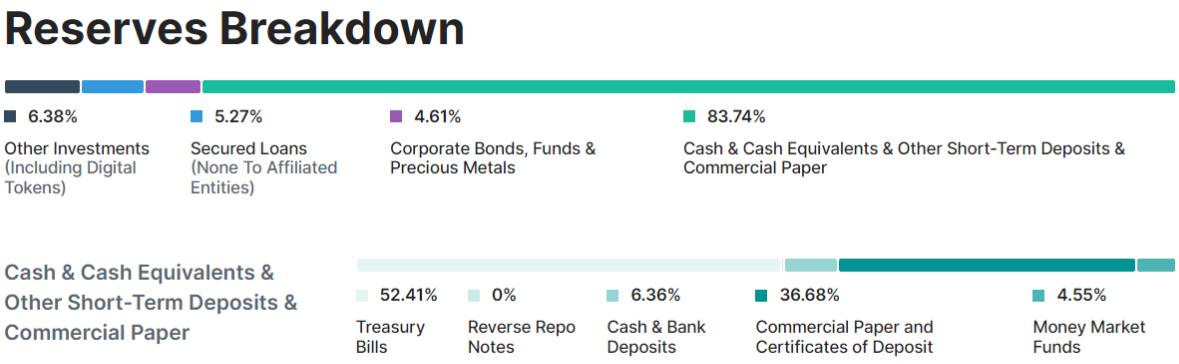


Image from Tether.io

Cash and cash equivalents make up nearly 85% of the reserves. Treasury bills (highly liquid, short term, government issued bonds) sit at about 40% of the total reserve amount.

Commercial paper (short-term corporate bonds), on the other hand, do not have a government guarantee. If the companies go underwater, the debt is useless and Tether would likely not be paid. This is the biggest point of concern for holders of USDT, and although this number has decreased over time, there is still opacity regarding the companies that issue this debt. In fact, one hedge fund is betting $4 billion on the collapse of USDT due to worthless short term debt in the reserve.

Two things stick out that will be restrictive in the continued growth of USDT:

1. Lack of clear and regular audits
2. Centralized party controlling the reserve

Circle ($USDC)

In the same vein as Tether, Coinbase's partner company, Circle, issues USDC with a USD-equivalent reserve. The total market cap trails USDT significantly, currently around $50 billion. Like Tether, Circle has not been completely transparent surrounding its reserve assets. They once stated that all USDC issued is backed 1:1 with dollars in bank accounts, which was later proven to only be 60% cash and cash equivalents.

After the Tether scrutiny, Circle followed suit and began to issue monthly audit reports by the reputable Grant Thorton regarding their reserve assets.

Even though their reserve assets are less risky compared to Tether, there is still a point of concern regarding liquidity in the event of a mass redemption by USDC holders. Additionally, Circle has the same core issue as Tether: there is a single entity with complete control over the stablecoin, leading to issues around censorship and government crackdowns.

In an effort to solve this issue with USDT and USDC, we move to the first decentralized stablecoin to come onto market, DAI.

Decentralized Stables

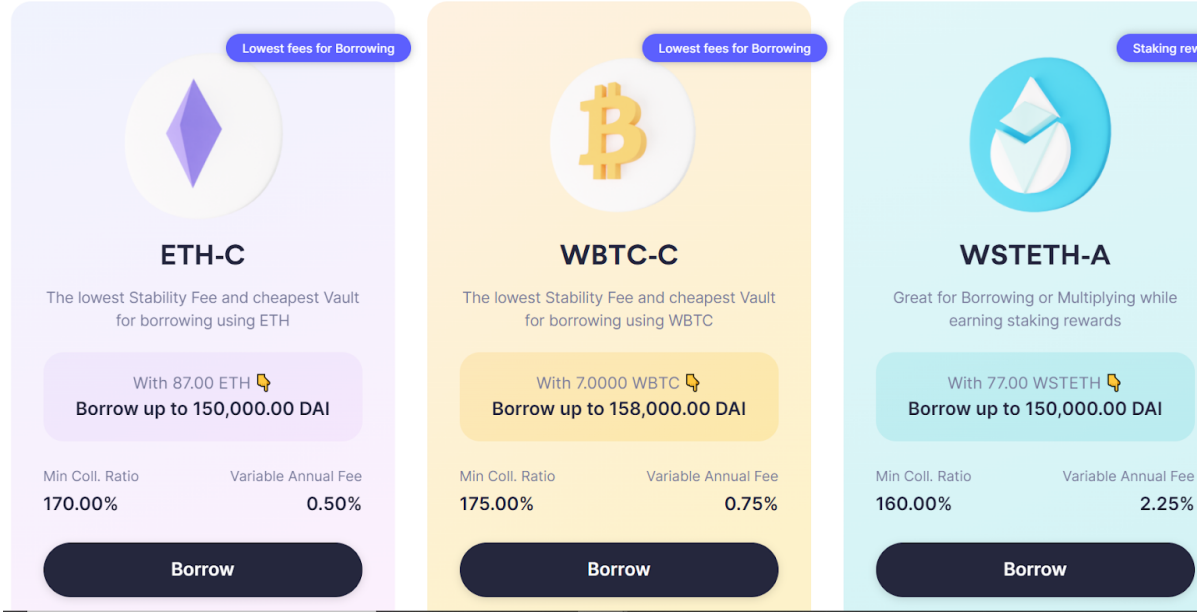
Maker DAO ($DAI)

Maker revolutionized the use-case for DeFi protocols by bringing a crypto-native stablecoin into the conversation. From this point forward, users were able to preserve value on-chain in a decentralized and censorship-resistant manner, as Maker was run under a DAO structure with the governance token $MKR.

Using the same framework above, centralization is not an issue for DAI, but their method of collateralization poses a unique challenge. USDT and USDC have an advantage as they are able to utilize a basket of stable (equivalent) assets with USD, meaning they can keep their collateral levels at a 1-to-1 ratio to outstanding tokens. DAI, with a north star of decentralization over capital-efficiency, does not want to rely on fiat for its reserve.

The initial way to mint DAI was by borrowing against ETH deposits. Let's say you had $1,000 in ETH and wanted to borrow some amount of DAI against that. By using the DAI-ETH vault, you can mint and subsequently use DAI in whichever way you choose. The downside to this, however, is that the collateral of ETH (and later more crypto assets), are **extremely volatile**.

Because the reserves of stablecoins need to be backed (at least) by the equivalent dollar amount of outstanding tokens, minting DAI requires overcollateralization and creates a liquidation risk for the borrower (if the collateral drops below the loan value, DAI automatically sells your ETH). Simply put, it is not capital efficient.



Oasis Vaults - Lowest Collateralization Ratio at 160%

Nonetheless, DAI has been quite successful since its inception in 2017, currently sitting at a market cap of under $9 billion after adding more collateral types. With this innovative model, however, comes obvious new risks. Because such a large portion of the DAI reserve is in ETH, at one point, the 2020 volatility left roughly 4 million in DAI uncollateralized.

MKR Token

Through its governance token, MKR, users can vote and manage the DAO concerning the following topics and more:

- Add a new collateral asset vault
- Adjust risk parameters for existing vaults
- Modify the DAI Savings Rate
- Trigger Emergency Shutdown

Value accrues back to MKR through buybacks from revenues and excess reserve assets. Currently sitting at around $32 million annually, but this number has been on an aggressive and steady downward trend lately.

It is also worth mentioning the stability methods in place to keep DAI at a $1 peg:

- Arbitrage: Bots are in place that use simple buy and sell scripts to quickly capture any profits resulting from DAI being above or below $1.
- Auctions: "Keepers" are third-party bots that take part in buying up discounted tokens when collateral levels become dangerously low. There are some really interesting functions in place that Keepers participate in to ensure the health of Maker reserve levels that you can read more on here.

Threats to DAI

Aside from capital inefficiency due to the high collateralization levels, DAI has another major risk. At the time of writing, ~45% of circulating DAI is backed by USDC, which as we just discussed, is a centralized stablecoin. So, DAI effectively is a decentralized-centralized stablecoin, which has been its biggest criticism as of late.

Because of these two downsides to an otherwise spotless stablecoin system, DAI has been threatened by more innovative **algorithmic stablecoins**, namely FRAX and UST. We will cover this in more depth in the 4pool section below.

Abracadabra ($MIM)

One of the iterations on DAI is the infamous Daniele Sesta project Abracadabra Money, a project that launched a stablecoin called Magic Internet Money ($MIM). Rather than depositing traditional crypto assets, however, the collateral used to mint MIM would

often be interest-bearing. There are countless examples of this type of token at the current stage in DeFI, but some of the most popular would be:

- xSUSHI
- CRV/CVX LP tokens
- yvWETH

Over time, these loans become self-repaying as the value of the collateral increases due to the underlying interest rate.

MIM briefly depegged from $1 on two separate occasions in 2021, but it still stands to have a player in the stablecoin wars if it can continue funding bribes. Right now, the MIM-3CRV pool on Curve has the 4th most value locked in the protocol. While the coin has fallen out of fashion, it's pretty impressive that it’s managed to hold peg throughout poor market sentiment and continues to show the effectiveness of overcollateralized models.

Both MIM and DAI came up with a viable solution to the issue of centralization, but capital efficiency is where the new algorithmic stables saw their opportunity to enter the market, unlocking ‘cheaper’ ways to mint stablecoins.

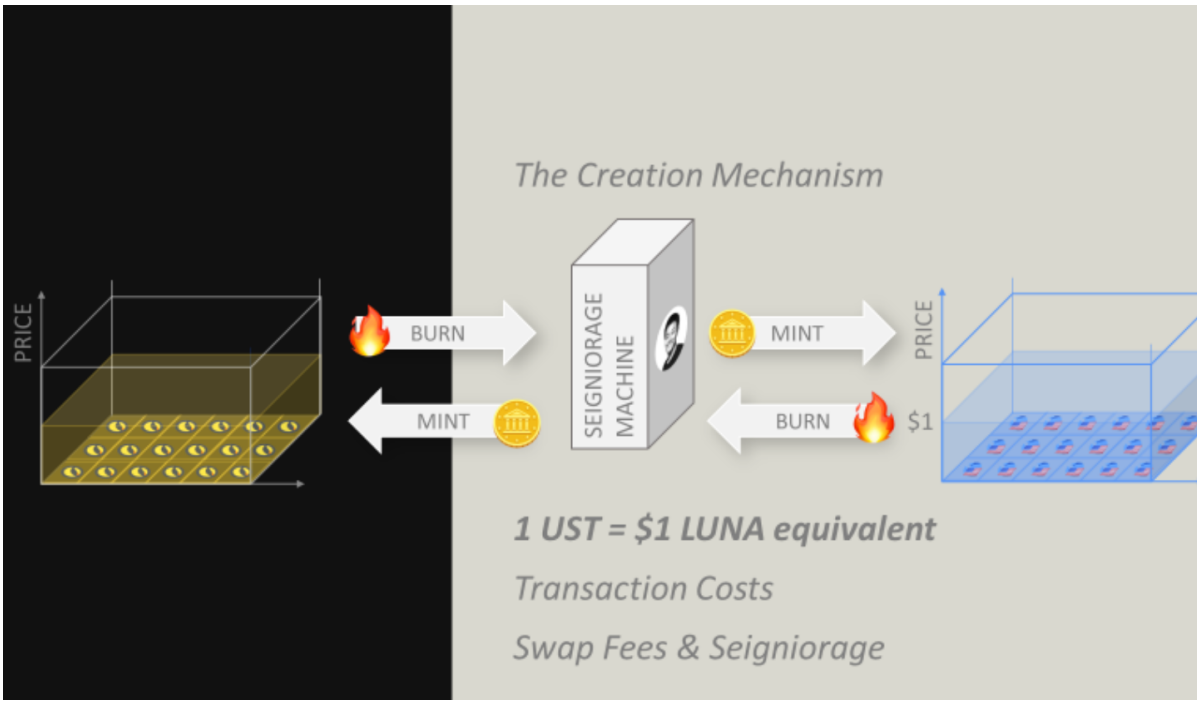
Alternative Stablecoin Models

UST

There have been various attempts at creating an algorithmic stablecoin to solve both the issues of centralized and overcollateralized stablecoins, but the one making the biggest impact in the world of DeFi has been UST.

UST is purely algorithmic, with nothing specifically backing the peg to $1. Instead, it relies solely on arbitrage to keep UST within a tight range:

- If UST >$1, users can mint UST by burning $1 LUNA and sell for a profit
- If UST <$1, users can burn UST to get $1 LUNA and sell for a profit



LUNA and UST Seigniorage Process

Demand for UST has skyrocketed over the past year and brought it to the 10th largest crypto by market cap at $18 billion, adding $8 billion this year alone, despite (or maybe because of) nasty market conditions.

And where exactly does this demand for stables come from? One source, for now: Anchor Protocol. By paying out a nice 19.5%* APY, Anchor makes it extremely simple for people to enter into the savings account and deposit their UST. The catch is that this interest rate isn't paid by organic protocol revenues, but instead subsidized by the founding team behind Luna.

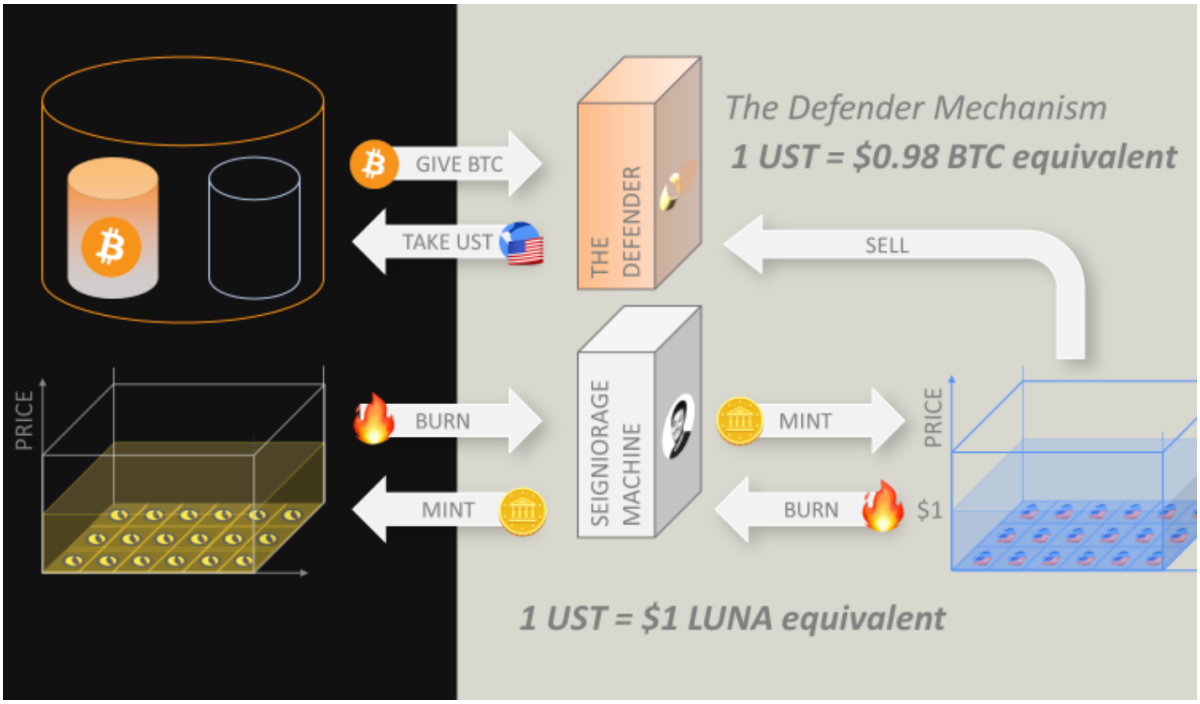
Another significant catalyst for demand has been the Cosmos ecosystem, which Terra directly benefits from. Blockchains that use the Cosmos IBC seamlessly interact with one another, and UST has become the stablecoin standard. Thus, it can be used to swap, borrow, and lend on all Cosmos IBC chains.

**Anchor's interest rate just recently went semi-dynamic and thus will be decreasing over the coming months*

Risks

Because of the high demand, Anchor currently houses more than **70% of all outstanding UST.** Theoretically, when the Anchor rate falls low enough that demand quickly goes away, many people will exit their UST positions in order to find better yield elsewhere. As UST is burned and swapped for LUNA, LUNA supply can quickly inflate, creating a death spiral that depegs UST and can leave holders with a worthless token.

To mitigate the depeg risk, UST can be swapped for $.98 of BTC - creating what is referred to as a "backstop" for the price of UST, at least until the BTC reserve is used up. This method all relies on creating more and more robustness in the system, but it's far from bulletproof.



BTC Backstop

Additionally, UST plays a big part in the so-called Curve Wars, with plans to integrate as a fundamental piece of CRV. We are still missing one piece before we can fully explain how this will help maintain the demand and use for UST, but the takeaway is that LUNA and UST have found a system that (for the time being) has worked to create a **decentralized** algorithmic stable without the collateral requirements of other stablecoins.

Improved Algo-Stables

Fei Labs - FEI

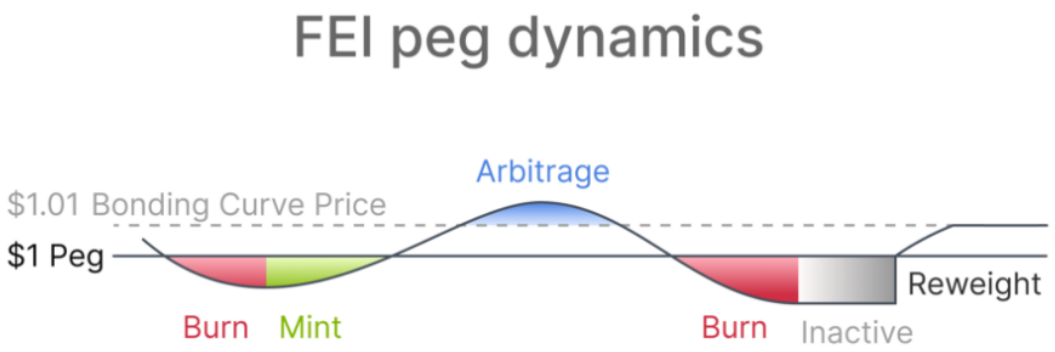
Fei Labs saw yet *another* opportunity to create a new stablecoin mechanism that eliminated the three flaws in the previous stables we've looked at:

- Centralization
- Overcollateralization
- Seigniorage

To do so, FEI utilizes two new mechanisms: a bonding curve and protocol controlled value, also known as PCV. The bonding curve was used to bootstrap initial liquidity to the stablecoin by offering discounted FEI in exchange for ETH deposits.

Beyond the traditional arbitrage method we have discussed above, FEI uses something called direct incentives to ensure the $1 peg of its stablecoin. The stablecoin works in the following way:

- Mints new tokens when it trades over $1
- Rewards users to sell over $1



FEI peg mechanisms

FEI actually started to institute a seigniorage mechanism after a merger with Tribe DAO, essentially to be a backstop way to maintain the $1 peg.

Risks

The reweight mechanism, pictured above, led to a cascading depeg in April. Although, as the protocol owns the majority of its liquidity (by utilizing the PCV), it can "reweight" certain liquidity pools to bring the price of FEI back to $1. However, when the price initially fell off of $1, the reweight mechanism created a "best price to sell" opportunity, leading to a heavy dump of FEI and pulling it as far as 29% off of $1.

FEI also has a substantial amount of its liquidity sitting in Rari fuse pools. While this creates cheap stablecoin liquidity for DAOs and helps grow the ecosystem, Rari has been known to be exploited in the past.

Finally, the launch of the protocol technically saw 1 billion of FEI minted out of thin air:

- Users deposit ETH to get discounted FEI
- PCV now has 1 billion worth of ETH
- Protocol mints 1 billion FEI to pair that and create the first liquidity pool

All of this is to say that creating a stablecoin that satisfies all the important points necessary is very difficult. Due to some of the hiccups that we have mentioned, FEI has struggled to gain any significant adoption.

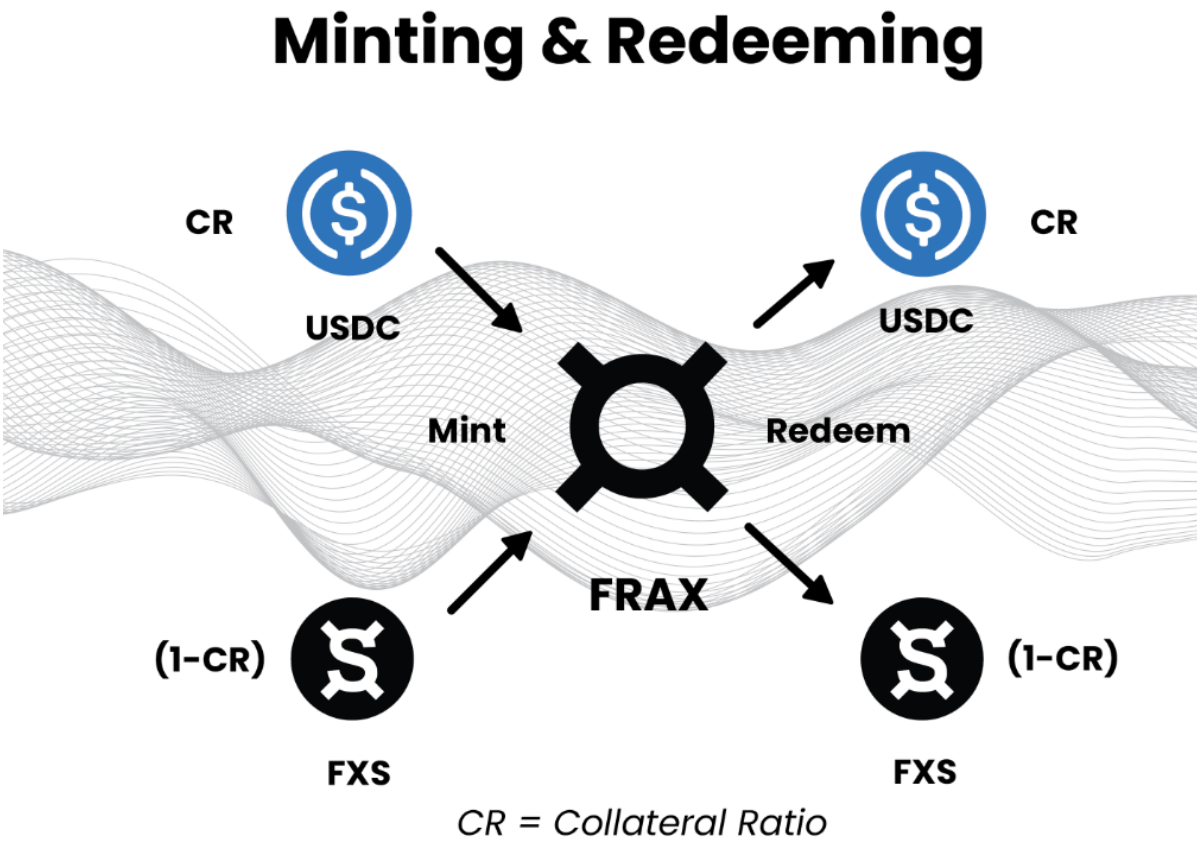
There have been new innovations in every model discussed so far, but each has its own trade-offs; although we think that Frax balances these trade-offs the best.

FRAX

The **Fr**actionally **A**lgorithmic stablecoin designed by Frax Finance is a truly innovative design. It sounds like it might be confusing, but it's relatively simple. Let's say you wanted to mint $100 of FRAX. The amount of stablecoin (USDC) collateral you need is dependent on the collateral ratio.

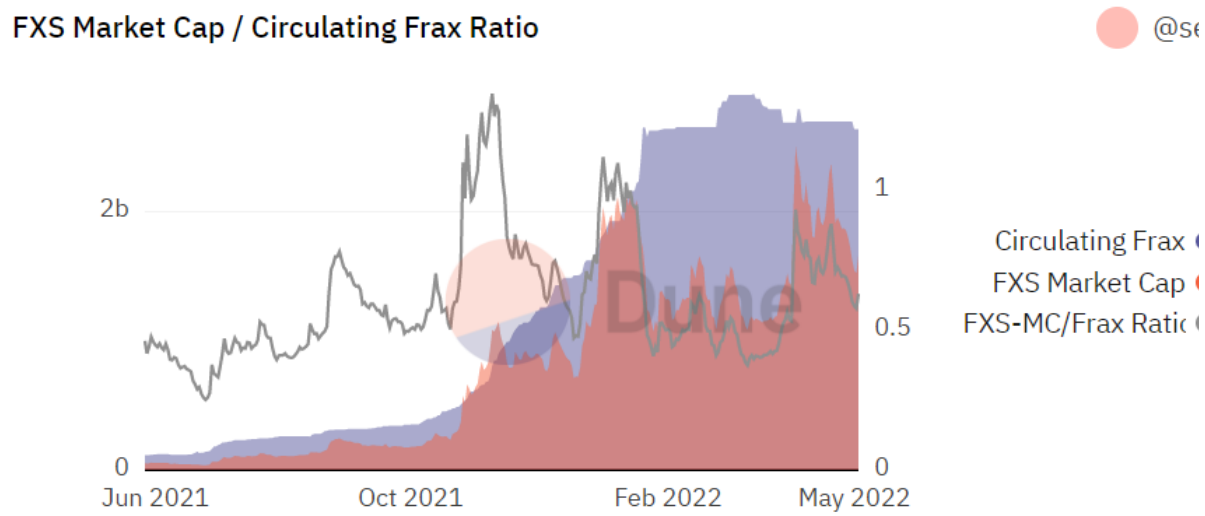
The current ratio is 85%. This means that you would deposit $85 of USDC, and $15 of FXS, the governance token for the Frax ecosystem (which gets burned). During a partial algorithmic phase (any point where collateralization ratio < 100%), the following happens:

- As FRAX is minted, FXS is burned
- As FRAX is redeemed, FXS is minted



FRAX Mint and Redeem Process

This has an inherent stability mechanism as participants in the ecosystem can adjust the collateralization ratio (CR) every hour by .25%, increasing the collateral ratio when price <$1 and decreasing CR when price >$1 This creates a loop where the price of FXS is determined by the demand for FRAX. We can see this through the positive correlation between outstanding FRAX and FXS market cap.



FRAX Dune Dashboard

AMOs - Algorithmic Market Operations Controller

The launch of FRAX v2 in March 2021 maintains the base stability mechanism described above, but allows for specific scripts to be created across various liquidity platforms, the largest of these being the Curve AMO.

Through rebalancing certain liquidity pools, the pool helps maintain the FRAX $1 peg, and earns significant yield through LP deposits in automated yield platforms. At the time of writing, Curve AMOs currently make up 67% of the total outstanding FRAX.

Risks

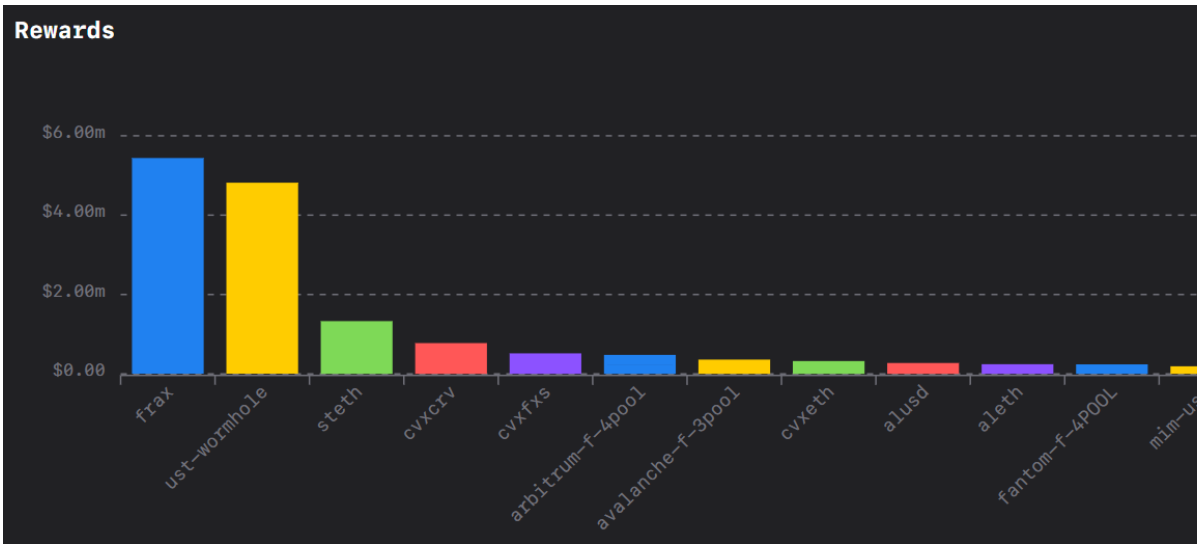
FRAX has not experienced a meaningful, long-term depeg to date, but that scenario can't be ruled out. Due to the AMO strategy, the FRAX ecosystem has its hands in a lot of different DeFi protocols. While this has fostered a large portion of the protocols growth, it could create a cascading effect if one point of operation were to slow or stop working.

Catalysts

There are some fantastic yields to be earned through the FRAX platform, and so long as the adoption continues to increase, FXS will experience positive price action. For example, simply depositing FXS tokens into Convex can earn you upwards of 24% APR.

Additionally, the creation of Curve's 4pool (that's a whole article in itself) provides a massive benefit for FRAX. Rather than compete with the leading algorithmic stablecoin, UST, Terra and Frax Finance have aligned their futures and are attempting to create the most **liquid stable-pool on Curve** consisting of USDC, USDT, FRAX, and UST.

From our most recent report on Redacted, you will know that this will easily attract the most liquidity due to the level of bribes paid to voters to direct emissions towards the 4pool. Just look at how much more Frax and Terra put towards their bribes compared to competitors



Curve Bribes Paid Via Votium

If you would like to read the full implications of this, check out [The Average Joe's Substack] post on the new rendition of the Curve Wars.

But the Frax team hasn't stopped there, and just recently has launched something very relevant in today's economic environment:

Inflation Linked "Stablecoins"

FPI

FPI (Frax Price Index) is an inflation-linked stablecoin based on the U.S CPI, which tracks the price increase over time for a fixed basket of goods. The CPI in itself is not a sufficient measure for crypto users, but works for the time being, and Frax has mentioned they are open to changing to something more crypto native in the future.

It sounds strange to have something track the rate of inflation, especially when that figure is above 8%. But the treasury of assets backing FPI simply go into the market to find stablecoin yield strategies to keep up with inflation.

- Any excess yield earned by the protocol is distributed to FPIS holders
- When there isn't enough yield generated by FPI treasury, additional FPIS is minted and sold on market, which is dilutive to current FPIS holders

Part of this revenue is fixed and distributed to FXS holders, so if you aren't positive about the general function of FPI, you can still benefit on some of the upside just through holding FXS, the governance token for Frax.

VOLT

Finally, VOLT is a FEI fork that utilizes a PCV-to-earn yield that is then distributed to VOLT holders to track inflation.

But, adoption for these coins might be tricky. In our current situation where inflation is approaching double digits, it sounds great to be able to passively earn that while also going out into the DeFi market to find additional stablecoin yield. But, this

inflation **will not** last forever, and periods of deflation, although seemingly unlikely, are entirely possible.

Anticipation for a deflationary environment, or even a situation where the level of inflation does not justify the risk associated with the inflation linked tokens, could lead to a mass redemption for the underlying assets and depeg event. It's important to note that inflation-tokens, so far, are all pegged, and thus have the potential to lose their price peg on the open market.

Conclusions and What's to Come

As we have outlined, stablecoins are one of the most important factors to continue the growth trajectory of DeFi. We need a robust ecosystem of stablecoins in place to facilitate decentralized transactions and allow users to take profits into reliable stable assets.

1. **Algo-Stables create the most capital efficient stablecoins**. We like the team behind FRAX, Sam has continued to ship and form great partnerships with other major teams in DeFi. The partnership with Terra and 4pool will create a lot of noise, liquidity, and growth when it is launched, should everything be successful.
2. **No one wants Tether to lead the way**. Somehow, USDT is still the largest stablecoin by market cap, but it is hard to see this last for the next decade. Its use in centralized exchanges, specifically Binance, will make it hard to go away for good. But, more efficient and user-benefitting stables will have to impede on Tether dominance. Also, should there be loads of bad debt backing USDT--you can imagine the situation that would follow.
3. **There will not be a single stablecoin that dominates**. We are firm in this belief, and cannot imagine an efficient decentralized financial system without multiple stablecoins. Thus, we prefer to concentrate bets on high-conviction stable protocols over holding a single project.

We hope you enjoyed this look into the full picture of the stablecoin environment in DeFi. Again, send us any questions you have or if you would like to discuss these topics in further detail.

We will also be hosting a podcast with Kirk, founder of Volt - so be on the lookout for that shortly.