a16z Stablecoin Primer for LPs

May 30, 2022

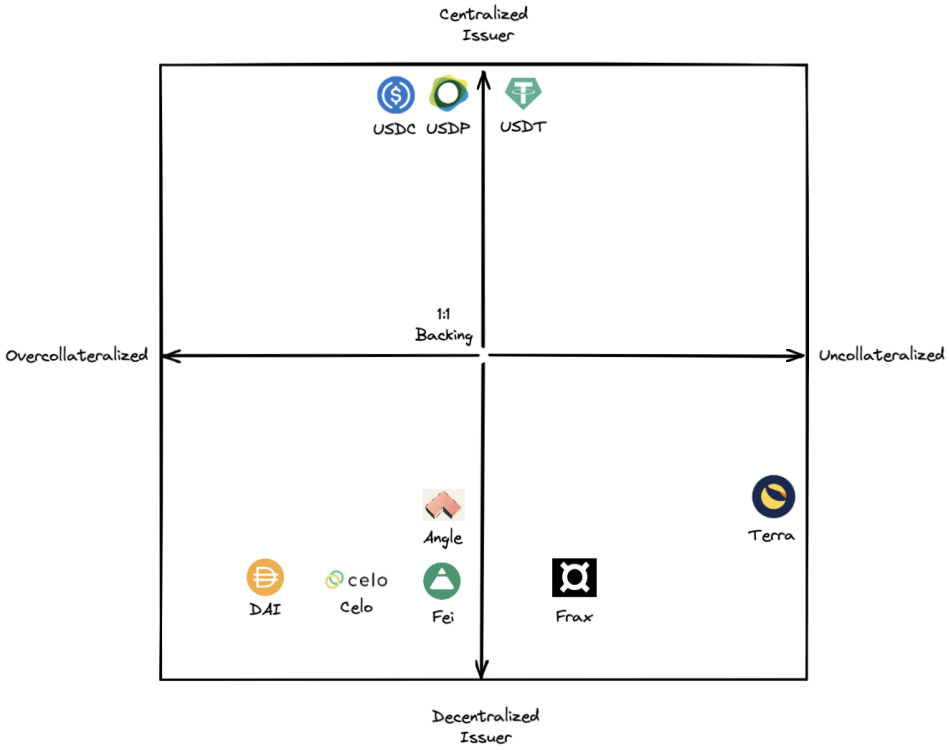
Executive Summary

- Stablecoins can be evaluated on two separate axes:
  - (1) issuance: centralized vs. decentralized
  - (2) external backing: undercollateralized vs. overcollateralized
- a16z's current investments are in decentralized and overcollateralized stablecoin protocols, which include MakerDAO, Celo, Fei, and Angle.
  - For these protocols, we typically hold the network governance tokens of these projects (and do not have material positions in the stablecoins themselves).

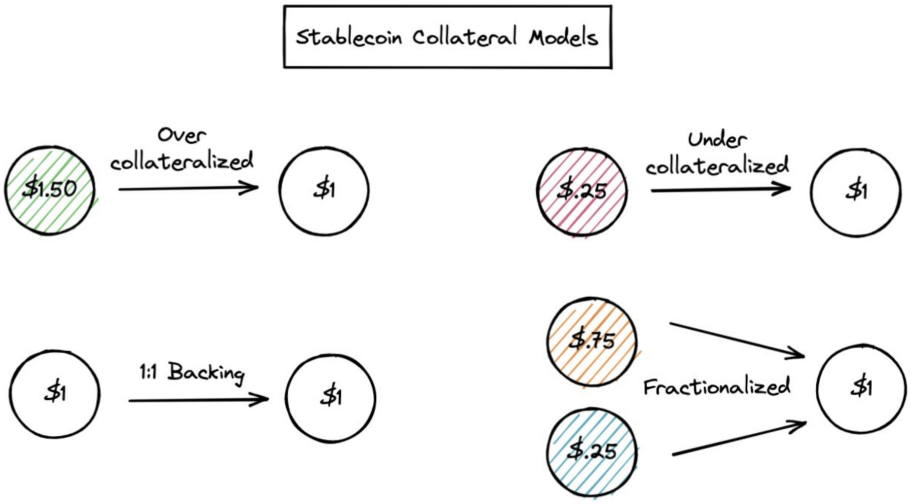
Overview

Stablecoins can be evaluated on two separate axes: (1) issuance and (2) backing.

The issuance process tells you the relative amount of decentralization or centralization of the issuing authority, or more directly, the risk of the stablecoin being blacklisted by a governing body. The ability to redeem varies among the protocols or projects. Alternatively, backing tells you what's behind it, or the relative safety of the asset itself and whether it is undercollateralized vs overcollateralized. The chart below covers where many of the major stablecoin projects fall on this basis.



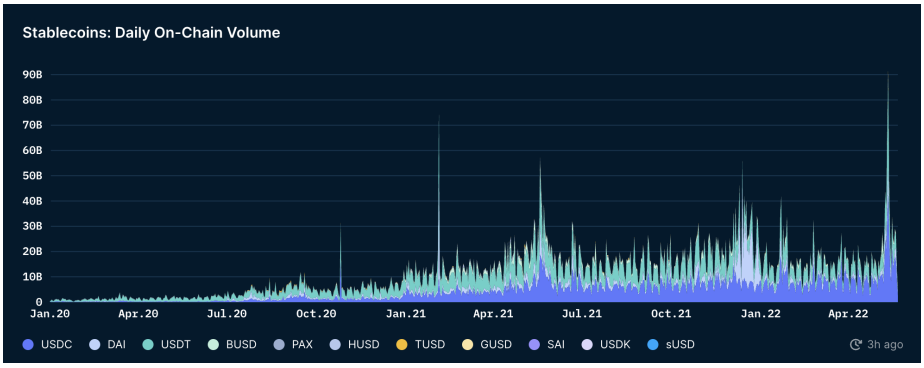
Based on this framework, we will evaluate centralized issuers versus decentralized issuers and overcollateralized versus undercollateralized designs.



Centralized Designs

Centralized stablecoins like USDC (Circle) and USDT (Tether) are among the most widely used financial instruments in crypto today because they are capital efficient and issued by a known entity. With centralized stablecoins, anyone can trade in $1 for $1 of an on-chain asset. The drawback involves relying on a centralized entity to custody that $1 and not lose it (backing), or freeze outstanding assets due to regulatory pressure (issuance). Here is an article on Tether describing some of these outstanding concerns.

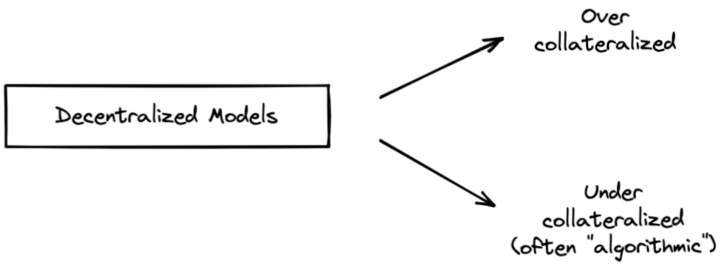
Because centralized stablecoins are issued $1:1, they are the most capital efficient models in crypto. As a result, the largest stablecoin issuers are USDT ($79B outstanding) and USDC ($53B outstanding). Daily volumes on Ethereum alone routinely exceed $10B for the top four centralized projects (Circle, Tether, Binance, Paxos).



Due to some of these considerations, there are also a number of decentralized stablecoin projects. These projects also issue a synthetic asset soft-pegged to the dollar, but do so in a manner that doesn't rely on one entity taking permanent custody of the $1 deposited.

Decentralized Designs

Decentralized stablecoin projects rely on a simple premise: users must "deposit" at least $1 worth of on-chain collateral to a smart contract (think Ethereum, or wBTC, or a native project's token) to get issued $1 of a synthetic asset against it. This leads to a key point - the *type* of collateral and the *amount* of collateral backing a stablecoin are really important. For decentralized designs, collateral is always on-chain. So these projects can be split into **overcollateralized** and **undercollateralized** designs in reference to their external backing.



Overcollateralized designs require you to put in more than $1 of an external asset to take out $1 of a new stablecoin, because there's no centralized entity custodying the asset you give them. We can't trust each other the same way. These designs are thus less capital efficient.

For example, some projects may require $2 of ETH to be locked into a smart contract to issue a $1 stablecoin. If that ETH gets down to $1.50 in value, the user faces a choice: close the position, or recapitalize it. If they do neither, and the price of Ethereum in the vault goes below $1.50, the protocol gets the right to liquidate the vault and keep the proceeds to ensure the system remains capitalized above a $1:1 ratio.

One example of this type of system is MakerDAO, one of our investments. It issues DAI, a stablecoin soft-pegged to the dollar, against more than a dollar of any asset (ETH, BTC, etc.). Since these assets are volatile in nature, MakerDAO requires external overcollateralization – if the backing drops, they automatically liquidate the assets. You can follow all of MakerDAO's financial details live here.

There are also decentralized designs **not** backed by external forms of collateral. Fully algorithmic stablecoins usually work by pairing a native token with a native stablecoin. The native asset "backs" the stablecoin because you turn it in to generate a stablecoin. This can be efficient, but highly circular. It relies on trust in the system and utility.

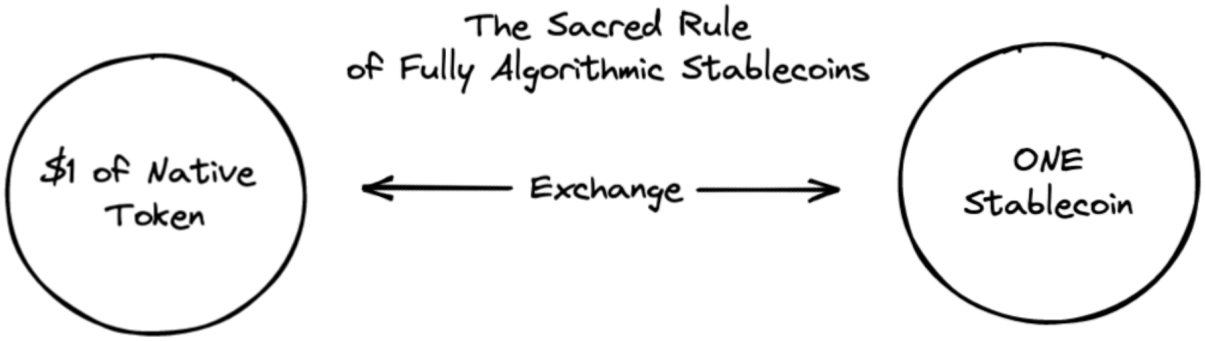
The most prominent example of this type of "fully algorithmic" design is Terra. Terra worked by issuing LUNA, its native token on an inflationary schedule. To create UST, the USD-pegged Terra stablecoin, users had to buy $1 worth of LUNA and turn it into the project, which then issued 1x UST (hopefully worth $1). This had a predictable side effect - as demand for UST increased (which it did due to the 20% yields offered on Terra's savings product Anchor), the number of LUNA (the token) in circulation decreased, driving up its price.

Terra kept the $1 peg through **an algorithmic mechanism**. It worked like this.

Below peg: I issue $1 of my stablecoin backed by my native token. If demand < supply, my stablecoin now trades at $.90. Traders can buy the stablecoin for $.90 off the market and turn it into me. I will issue them $1 of my native token (which I create out of thin air). Traders can sell the token and make 10%. Native token holders are diluted.

Above peg: Conversely, say demand > supply and the stablecoin trades at $1.10. Traders can buy $1 of the native token, turn it in for one stablecoin, sell it into the market for $1.10, and make 10%. This balances supply and demand, increasing the amount of circulating stablecoins, and drives the peg back to $1.

The critical rule in most algorithmic designs is the $1 native token:1x stablecoin ratio. This is not a $1:$1 ratio! **This is a $1 worth of the native token to one stablecoin ratio.** This is the arbitrage opportunity, the core of algorithmic stablecoin design.



This leads to the potential structural flaw of such designs: there is nothing of external value to the system backing the stablecoin. This can lead to a loss of faith in the system and a run on the stablecoin - traders and the community may lose faith in the arbitrage opportunity due to external factors, very similar to a currency crisis.

Critics of algorithmic stablecoins often point to this circular dynamic as the critical flaw. If the peg stays below $1, not enough traders may purchase the stablecoin and turn it in for the native token. To restore the peg, the native token gets issued at increasingly high rates, dumping its price. It becomes a death spiral. This is what happened to Terra.

To mitigate these concerns, many projects use **exogenous or external collateral** to back their stablecoins. They also do it at an amount well over $1 per stablecoin issued to account for the potential volatility of the backing.

Projects that use an overcollateralized design with external backing include each of our investments: **MakerDAO, Fei, Celo, and Angle.** We invested in these protocols pre-token launch and we typically hold the network governance tokens of these projects and do not have material exposure to the stablecoins themselves. For example,

- For MakerDAO, we own MKR, the native network governance token that represents ownership in the network, not DAI, the MakerDAO stablecoin.
- For Fei, we own TRIBE, the governance token, not FEI, the Fei stablecoin.
- For Celo, we own CELO, the governance token, not cUSD, the Celo stablecoin.
- For Angle, we own ANGLE, the governance token, not agEUR, the Angle stablecoin.

As the space evolves, we will continue to evaluate and invest into the most promising protocols at every stage and assess the merits of each investment opportunity based on the founders and their plans. To the extent you have additional questions on this or any other topic, please don't hesitate to reach out.

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