S&P Global
Ratings

Stablecoin Stability Assessment

FRAX

Jan. 28, 2025

Summary

S&P Global Ratings assesses the ability of FRAX v3 to maintain its peg to the U.S. dollar at 5 (weak). FRAX is a decentralized dollar-pegged stablecoin issued through FRAX Finance Stablecoin protocol. After achieving a fully externally collateralized "v3" with a 1 to 1 value against the U.S. dollar, FRAX recently announced it will be rebranding to frxUSD. The launch, announced Dec. 15, 2024, will include a transition for the stablecoin that will offer direct fiat redemption capabilities. The Frax community approved frxUSD backed by BUIDL on Jan. 2, 2025. The timeline for the transition remains unclear. The earliest version of FRAX launched in December 2020 as a combined algorithmic and collateral-backed stablecoin. Our assessment reflects the characteristics of FRAX v3 (FRAX).

Our asset assessment of 5 (weak) reflects the allocation, which includes crypto assets with significant market value risk, which is not mitigated by any liquidation mechanism or sufficient reserve overcollateralization. Although the collateralization ratio increased above 100%, it is currently below. At these levels, even when above 100%, available overcollateralization is insufficient to cover the collateral's market value risk in our view. FRAX is primarily backed by collateral on the blockchain (on-chain) using smart contract protocols that balance the amount of FRAX versus other assets to maintain its 1 to 1 peg. The assets include various cryptocurrencies and some stablecoins. FRAX Finance also holds a small portion of cash and equivalents with a public benefit corporation, FinResPBC.

FRAX has significant dependencies on smart contracts and oracles. These are necessary to execute various protocols, including trades and loans, and oracles connect information to these protocols. We believe this is commensurate with an assessment of 5 (weak).

As frxUSD is rolled out, we will continue to monitor its impact on FRAX. The current launch will allow for legacy FRAX to remain fully functional across the Frax ecosystem and supported protocols and chains. Any FRAX or sFRAX on the Frax Ecosystem layer 2 Fraxtal will be automatically transitioned to frxUSD and sfrxUSD. The timeline for transition and any other mechanisms for changing FRAX to frxUSD are not public at this time.

This report was not produced at the request of the stablecoin issuer or sponsor and without their input.

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For more on our approach and definition of price stability, see our Analytical Approach: Stablecoin Stability Assessments »

Asset assessment	Adjustment	Stablecoin stability assessment
1 | Very strong 2 | Strong 3 | Adequate 4 | Constrained **5 | Weak**	**Neutral (0)**	**5** **Weak**

Assessed on a scale of 1-5, where 1 is very strong and 5 is weak.

Asset assessment: 5 | Weak

1 | Very strong	2 | Strong	3 | Adequate	4 | Constrained	**5 | Weak**

FRAX's on-chain collateral assets are available on its website with addresses for verification. After more than a year since initiation of transition to the 100% collateralization protocols, FRAX has increased its collateralization ratio and has fluctuated close to 100%, with some days above 100%, and as of Jan. 26, 2025, it had fallen to just below, at 99.2%. At these levels, even when above 100% we do not view FRAX as holding significant excess balances to address the current risks of the asset allocation, which include volatile cryptocurrencies. The balance sheet currently holds a diverse set of cryptocurrencies. Collateral can be deposited and held by FRAX's comptroller address, as loans in Fraxlend, in exchange pools with Curve, or exchanged on Fraxswap. There is also some use of real-world assets (RWA).

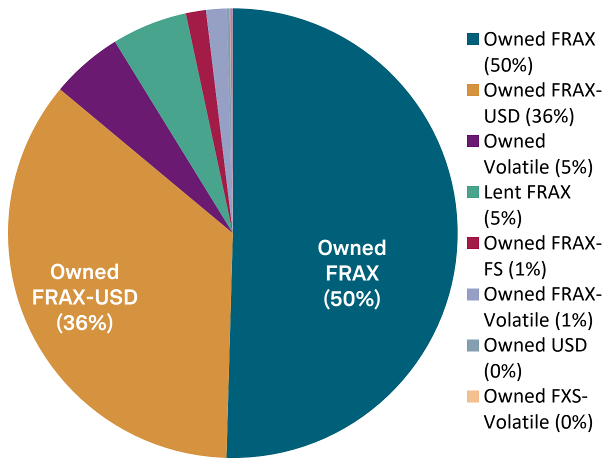
FRAX uses multiple algorithmic market operations (AMO). Those native to FRAX, such as Fraxlend, Fraxswap, and FXB, and also the external Aave protocol. Assets in the Fraxlend protocol are loans organized around a single collateral type and risk parameter, including thresholds for borrowing interest rate and minimum collateralization. These loans require collateral and, if the value of that collateral falls below the minimum overcollateralization threshold, the collateral is liquidated for FRAX to repay the loan. Fraxlend was implemented in September 2022. The assets held through pools include other stablecoins and FRAX is close to $1.00 value. Fraxswap is based on Uniswap V2 protocol where traders swap directly from one token to another in a token pool. The assets in the Fraxswap protocol are used to help keep the price stable, and recurring profits can be used to purchase FRAX and burn FRAX (that is, remove tokens from the available supply to decrease the number in circulation).

Liquidity pools are where a smart contract mints FRAX tokens for collateral in the pool or removes collateral from the pool when redeeming FRAX. Each pool contract has a pool ceiling (the maximum allowable collateral that can be stored to mint FRAX) and a price feed for the asset.

Our analysis focuses on the risks to the stability of FRAX from the perspective of all FRAX holders rather than specific pools or exchanges. Once owners hold FRAX, it can then be used to transact on-chain and therefore may be held by anyone. FRAX tokens are fungible, meaning that FRAX holders are not exposed to one specific asset but to the risk of any loss across all pools as well as to the minting and burning protocol through Fraxswap.

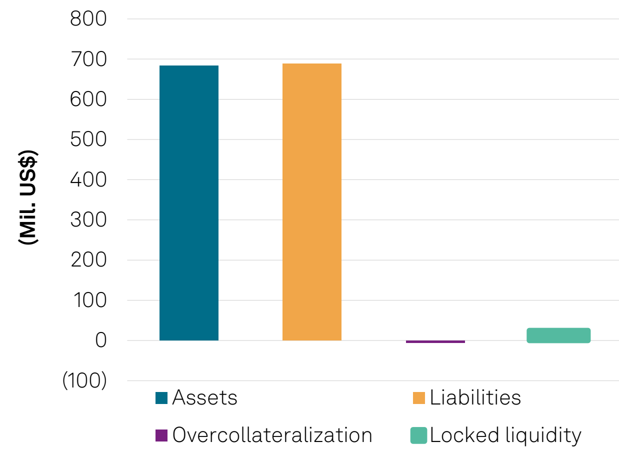
The current balance sheet shows slightly below 100% collateralization. The current FRAX balance sheet is made up of stablecoins, pools of combinations of FRAX and stablecoins, FRAX and its governance token FXS, more volatile cryptocurrencies, and pools with more volatile cryptocurrencies. As of Jan. 26, 2025, 50% of the FRAX balance sheet is owned FRAX, 36% is in a FRAX-stablecoin pool, 5% is held in direct exposure to crypto assets (self-defined as a volatile cryptocurrency), and the remainder a combination of other pools and loans. Currently less than 1% of assets are off the blockchain, which FRAX Finance reports to be bank deposits insured by Federal Deposit Insurance Corp. and short-term U.S. treasury bills.

FRAX's assets



Source: S&P Global Ratings. Frax balance sheet.

FRAX's balance sheet, Jan. 26, 2025



Source: S&P Global Ratings. Frax balance sheet.

Adjustment: Neutral

Neutral	Negative

Overall adjustment

In our view, FRAX's reliance on both oracles and interconnected smart contracts remains a weakness. This weakness is commensurate with an assessment of 5.

Governance: Movement to a more decentralized on-chain dual-governance system

- With FRAX v3, the group has fully on-chain governance using Frax Governance module (frxGov). The importance of this on-chain governance is that it aims to allow those vested in the success of the ecosystem to drive it. However, the interconnectedness of the protocols and broader scope of the FRAX ecosystem will require thoughtful governance when changes are made. Concentration of the stablecoin's holders could raise risks. On the other hand, if there is true decentralization, there will be no ability for FRAX team members to respond quickly to emergencies. Founders have publicly acknowledged some of the tradeoffs of on-chain governance but recognize this as part of the push toward decentralization.
- There is a high degree of transparency. frxGov is dependent mostly on Compound/OpenZeppelin governor contracts. One path is driven by holders of the FRAX governance token, veFXS, and the other by FRAX team members. The first follows a timeline where holders of veFXS vote on the proposal with a long voting period and high quorum. For FRAX team member proposals, there is a short voting delay and a lower quorum than for proposals made by the veFXS holders. Voting power is the sum of the held FXS and veFXS. Voting is now carried out on Fraxtal, though previously it was on Ethereum.
- Crypto collateral assets are available on chain. However, each pool's pairing and allocation require pool-by-pool investigation to calculate non-FRAX coins available for collateral. For RWA, FRAX works with a public benefit corporation, FinResPBC, to provide third-party verification of the off-chain assets backing the RWA vaults. FRAX has noted that RWA partners must report the custody, broker, banking, and trust arrangements used while holding the assets, at least monthly. However, currently there are no publicly available documents for verification of the RWS reported for FRAX. The percentage of RWA is minimal at this point.

Regulatory framework: No regulatory regime

- Frax is not regulated. Reserve assets for crypto-related loans are in a smart contract and not under the custody of a centralized entity, limiting the risk of assets being tied up in bankruptcy proceedings. However, it is uncertain how any dispute to the outcome of the smart contract would be treated in court in different jurisdictions. Assets held by the FRAX comptroller could be considered property of the broader FRAX Finance.
- FRAX has noted specific safety and reporting expectations for the reserve for RWA but there is no public reporting available for verification.

Liquidity and redeemability: The peg aims for 1 to 1 value, but does not guarantee redemption

- As a decentralized stablecoin, FRAX cannot be redeemed against an issuer per se. FRAX holders must rely on centralized exchanges for convertibility to fiat U.S. dollars.
- FRAX's market capitalization has remained relatively stable. As of Jan. 26, 2025, it was $688.8 million, up slightly from $649.5 million on Dec. 10, 2023.
- Liquidity pools that pair FRAX with other stablecoins is another avenue that could help with liquidity and, ultimately, redeemability.

Technology and third-party dependencies: Reliance on smart contract interactions and oracles, as well as the overall FRAX ecosystem

- FRAX Finance is a multi-chain protocol compatible with Ethereum, Dogechain, avalanche, fantom, BSC, Polygon, Arbitrum, and Moonbeam.
- We view the reliance on third parties and smart contracts as an elevated risk for FRAX. The FRAX ecosystem is highly reliant on smart contracts and oracles.
- In the absence of a centralized issuer, the stability of the peg is more complex because smart contracts govern the liquidation mechanisms and peg-stability modules. At least three subprotocols are required to function properly to maintain the FRAX peg.
- Fraxlend, Fraxswap time-weighted average market maker orders, and Curve are used to direct the broader FRAX transactions through monetary-policy-like supply expansion and contraction mechanisms. The AMOs can mint FRAX stablecoins into automated market makers (AMMs; decentralized exchanges based on algorithms) or lend FRAX, depending on preprogrammed conditions.
  - Fraxlend: A lending platform that creates pairs of small asset pools for borrowing and lending.
  - Fraxswap: A protocol used to support large trades of FRAX over long periods of time in a trustless environment, that is where no trusted intermediary is needed. It is fully permissionless (open to all participants, without requiring authorization). The use includes buying back and burning FXS with AMO profits; minting new FXS to buy back and burning FRAX stablecoins to stabilize the price peg; and minting FRAX to purchase hard assets.
  - Curve/Aave: Commonly used protocol for pools of cryptocurrencies, mostly stablecoins with FRAX.
- The peg relies on oracles to support the tracking of the U.S. dollar with a combination of Chainlink oracles and internally driven (through governance), approved reference rates.
- sFRAX: Frax Finance has also introduced a new mechanism for integrating RWA, called sFRAX (Staked FRAX). With sFRAX, holders will get a weekly yield in FRAX stablecoins. The annual percentage yield (APY) for sFRAX aims to mirror the interest rate on reserve balances at the U.S. Federal Reserve. The APY is set by the governance module, frxGov. This addition creates an option for those on the blockchain, using FRAX, to gain yield by investing more in pools on chain when returns are higher there, or have FRAX pivot when returns can be higher in RWA.
- The underlying contracts have recent audits of several of the smart contracts, though there are some high-risk findings. However, the contracts are clearly identified and available for

review. There is also a bug bounty program in place that offers compensation for identifying and reporting vulnerabilities.

- The more recent RWA vaults could introduce dependencies and counterparty risks for managers of those assets as well as custodians or brokers, which could delay the liquidation process.

Track record: Version 3 shows stability, but no substantial increase in adoption and changes ahead

- The earliest version of FRAX launched in December 2020 as a combined algorithmic and collateral-backed stablecoin. In March 2021, FRAX announced its v2 upgrade, which incorporated additional AMOs but was still a combined algorithmic and collateral-backed stablecoin. Version 3 moved to full external collateralization and has had a relatively good track record of stability.
- The latest additions to FRAX, new smart contracts, and protocols as part of v3 have been in operation since mid-October 2023 and with frxUSD, there continue to be new additions and transitions for the ecosystem.