Risk Assessment - cvxFXS Collateral on FiRM

Useful Links

- Coingecko: https://www.coingecko.com/en/coins/convex-fxs
- Website: https://frax.convexfinance.com/
- Github: https://github.com/convex-eth/platform
- Blog: https://convexfinance.medium.com/
- Twitter: https://twitter.com/ConvexFinance
- Main Discord: https://discord.com/invite/TTEVTqY488
- Bug Bounty: https://docs.convexfinance.com/convexfinance/faq/bug-bounties
- Docs: https://docs.convexfinance.com/convexfinance/
- Voting: https://vote.convexfinance.com/#/
- Forum: https://gov.frax.finance/

Background

cvxFXS poses another unique opportunity for FiRM to lead the Defi space in wrapper collaterals. As with cvxCRV, a newly deployed curve pool with EMA price feed for cvxFXS would enable a reliable oracle solution which was previously not available.

Some terminology:

- FXS is the governance and utility token of the Frax Finance protocol. It is used to govern the protocol, earn yield, and participate in the Frax ecosystem.
- veFXS is a locked version of FXS that offers additional benefits.
- cvxFXS is a tokenized version of veFXS.

The primary cash flow distribution mechanism of the Frax Protocol is to veFXS holders. Cash flow earned from AMOs, Fraxlend loans, and Fraxswap fees are typically used to buy back FXS from the market then distributed to veFXS stakers as yield. The emission rate varies depending on protocol profitability, sources of cash flow, market price of FXS, and governance actions. Historical view of veFXS yield can be viewed here: https://app.frax.finance/vefxs

cvxFXS can be staked on Convex to receive fees one would get for staking their veFXS on Frax, as FXS. Liquid wrappers allow FXS holders to receive fees without locking it for 4 years and provide a chance to exit the position. We will be focusing this study on cvxFXS and Convex Finance.

Protocol Analysis

Org. Structure

- ☐ **Is the Protocol a DAO? How is it governed eg. delegates , snapshot (10)**

Convex's core principle is to act as a proxy for a group of CRV holders that want to jointly influence Curve decision-making to improve rewards for Liquidity Pools of their choosing. Convex provides additional DeFi returns to Curve liquidity providers and CRV stakers. By pooling together individual users, the protocol provides the users with higher rewards and earning with the only downside being that the users lose their voting rights on Curve.

For governance, voting occurs on the Snapshot platform (which is the governance forum) and there are also debates on the discord channel. The governance process is well formalized and documented in the Convex docs under Voting and Gauge Weights.

- ☐ **Does Protocol publish analytics / transparency via Dune or similar (0)**

No. Third party such as DeFiLlama publish insights (e.g. token unlocks schedule) with information derived from the Convex official docs.

- ☐ **working group structure (3)**

Since the Convex team is not clearly identified, working group structure is unclear as well. A single 3 of 5 multisig performs several functions which are outlined here.

- ☐ **are core contributors compensated / Doxed (5)**

There is no clear identification of the Convex team neither on the website nor in the documentation. Harry has a working relationship with the Convex Founder C2TP. Kendrick Llama, Winthrope, and Charlie are also identified on Discord as being part of the team. The Inverse team has a working relationship with C2TP.

- ☐ **Any known controversies in crypto space (e.g. Sifu) (10)**

None.

- ☐ **do they have a security or risk management team (0)**

Unclear for the same reason outlined in working group structure section.

Multisig Structure

- ☐ **Is protocol transparent of multisigs and signers, List/links of multisigs, purpose, and setup x of x (10)**

The admin controls the protocol through the multisig; the multisig has five members two of which are from the convex team. The multisig admin have the following capabilities: update the stash factory and the pool manager, control the arbitrator vault, change platform fees allocated to takers with hard-coded ranges, set up the treasury address and allocate up to 2% of the platform fees back to this address, control the treasury account, vote for proposals and gauge weights, et distribution weights on the master chef, shutdown and/or pause new deposits to pool staking contracts and others, apply a new operator the whitelisted proxy if the current operator is completely shutdown and add and/or remove rewards.

- ☐ **Can multisigs interfere with collateral options? EOA minting (10)**

Admin control information and ownership is documented here. The relevant contracts are clearly identified as immutable. Smart contract change capabilities are well identified for all Convex contracts. Pause control documentation is present.

Influence, Reputation, and Partnerships

- [ ] **How long has the protocol been around , have they endured long bear markets (8)**

Convex Finance was launched in April 2021, and, while still very much relevant and a leading player in the DeFi space, TVL is down 84% from ATH ($21.16B down to $3.31B) and the Convex Market Cap is also down 84% ($2.29B down to $362.5MM). They are enduring their first bear market, accumulating CRV and FXS.

- [ ] **Have they been exploited and how was it handled , was value restored to users (10)**

No previous exploits.

- [ ] **Current and notable past partnerships , are they a net positive on the DEFI space (10)**

Convex holds close ties to both Curve and Frax. The ties between Convex Finance, Curve Finance, and Frax Finance are beneficial for all three projects. Convex Finance is able to offer users higher yields and boosted rewards, which attracts more users to the platform. Curve Finance is able to attract more liquidity, which makes it a more attractive exchange for users. Frax Finance is able to increase its adoption and reach a wider audience.

The ties between Convex Finance, Curve Finance, and Frax Finance are a positive development for the DeFi ecosystem. It shows that the DeFi community is working together to build a more robust and user-friendly ecosystem.

Audits & Bug Bounties

Previous and Ongoing

- [ ] **Previous and Ongoing audits & bounties with links (7)**

Convex was audited once before deployment. Convex offers a bug bounty of up to $250K.

Contracts in Scope

- [ ] **Is the scope a comprehensive list of contracts including collateral and wrappers**

Yes.

Reward Payouts

- [ ] **Rewards paid, vulnerabilities found with severity**

One past case, where a non-critical bug was disclosed and a payout issued. Details here.

Collateral Analysis

Oracles

- ☐ **Available Chainlink Oracles**

FXS has an available Chainlink price feed.

- ☐ **Does the asset have a backup oracle**

No

- ☐ **Any advanced oracle implementation required**

In our oracle implementation for cvxFXS, we'd cap the max price using the FXS chainlink price feed, and use the EMA reading from the new cvxFXS/FXS LP when it reads prices below 1 FXS.

Using the chainlink price feed for FXS as a "price ceiling" for cvxFXS makes sense since there are no scenarios aside from malicious ones where the price of cvxFXS would ever be greater than FXS. Together with FiRM's PPO safety feature, we believe these measures are enough to protect against upward price manipulation of the cvxFXS asset.

As for downward price manipulation, something to consider is the EMA half-life. The new Curve stablepools are deployed by default (using the UI) with an EMA Half-Life of 10 minutes. For our intents and purposes, a half-life of 30 minutes would result in a more resilient EMA price reading in the context of a malicious actor trying to manipulate the price downwards (in order to profit from liquidations). EMA Half-Line can be adjusted by Curve gov after deployment, or it can be set on deployment using this proxy admin contract.

Other safety measures (that carry obvious cons) the PWG might consider here are:

- Using an EMA that gives more weight to older price readings.
- Using a consensus mechanism though this would require multiple trusted oracles.
- Implementing a circuit breaker though inefficient as it would require governance to intervene and 5+ days to reactivate the market (especially a problem if triggered incorrectly)
- Exploring the use of comparing last used price with EMA price, and causing reverts if the difference is too large.

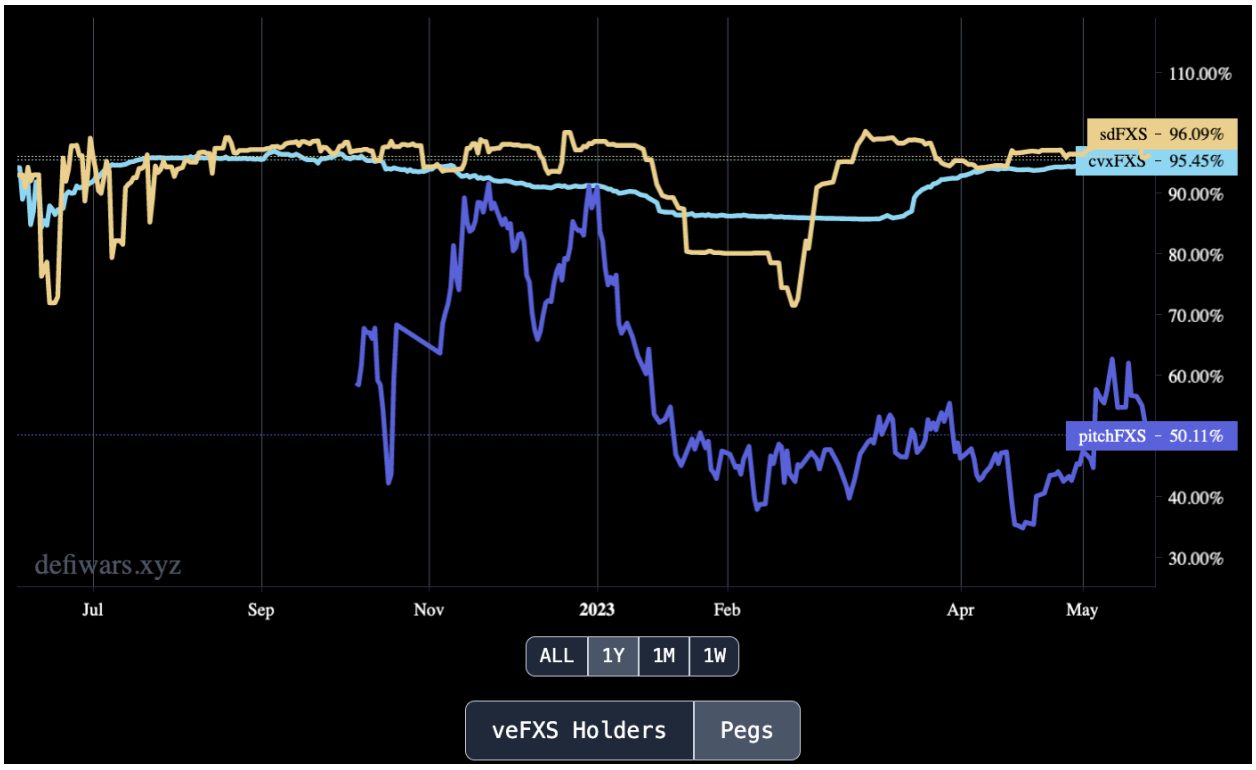
- ☐ **Liquidation Routing, Do liquidations require a wrapper?, accessibility**

cvxFXS>FXS>USDC>DOLA

cvxFXS>USDC>DOLA

- [ ] **Peg Risk if any**

One can assume healthy use of the fxsCRV market on FiRM will positively affect the peg.



Token Statistics

- [ ] **Contracts, upgradable?**

The relevant contracts are clearly identified as immutable as identified here.

- [ ] **Price / Market Cap / Circulating Supply / Locked Supply / True Circulating / Total / Max**

Coingecko

Price	Market Cap	Circulating Supply	cvxFXS/FXS Supply (%)
$6.88	$45.7M	6,654,241	6.65

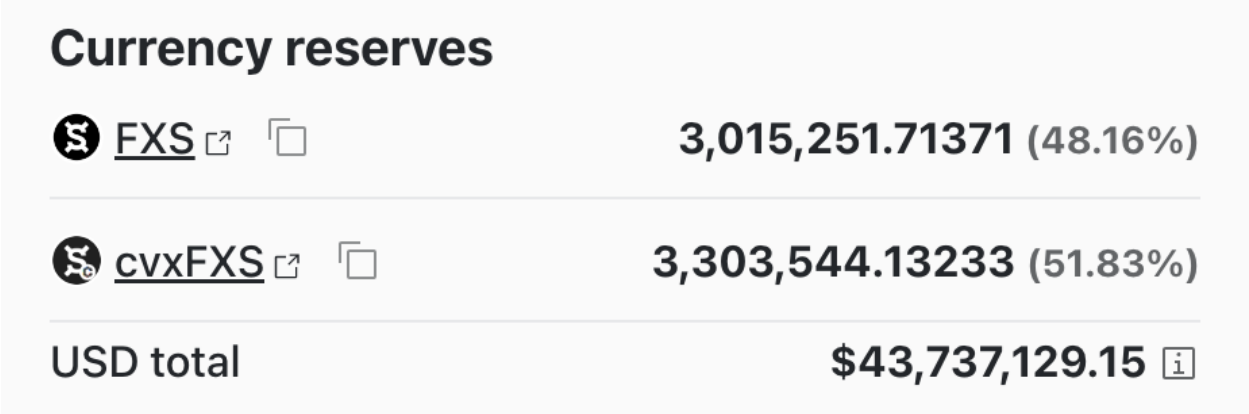
Liquidity

- [ ] **Mainnet Dex Liquidity**

LP	Protocol	Liquidity	24 Hour Volume
cvxFXS/FXS (old)	Curve	$43.74M	$57k
cvxFXS/FRAXBP	Curve	$2.17M	$55k

Liquidity migration from the curve pool with deepest liquidity to an upgraded Curve pool with the new price oracle has yet to commence. This will affect both slippage and price impact figures and will thus require a revised analysis that may affect the RWG parameter recommendations.

At the moment the two Curve LPs shown in the table above are the sole LPs. cvxFXS can count on a strong peg (close to 1:1) due to deep FXS backing in the LP.



☐ **On-Chain Slippage / price impact (May 22nd)**

Trade	cvxFXS	FXS	USDC	DOLA	Slippage (%)	Price Impact cvxFXS -> FXS (%)
$10,000	1459	1396	9990	10007	0	0
$25,000	3649	3491	24897	24947	0.21	0
$50,000	7299	6983	49690	49790	0.42	0.01
$100,000	14598	13967	99143	99340	0.66	0.01
$250,000	36496	34915	246640	247109	1.16	0
$500,000	72992	69819	492212	493077	1.38	0.01
$1,000,000	145985	139639	966699	968227	3.18	0.04
$2,000,000	291970	279196	1881809	1884123	5.79	0.10

$4,000,000	583941	558171	3544243	3546504	11.34	0.26
$6,000,000	875912	837015	5039506	5040104	16.00	0.96

- ☐ **Token Holders**

Total Token Holders: 4,654

Holder or Protocol	**Percent Supply**
(contract) 0x49b4d1...8e37E31a	49.92%
(contract) 0xd658A3...22b5d94A	46.31%
(contract) 0x21d158...8D6c6267	2.33%
(contract) 0x72a193...e32db86E	0.152%
0x549735...91eebdd2	0.083%

Emissions

- ☐ **Token Emissions schedule**

There is no emissions schedule for cvxFXS

FXS Distribution and emissions are as follows:

- **Community (65% – 65,000,000 FXS)**
  - 60% – Liquidity Programs / Farming / Community – Via gauges & governance halving naturally every 12 months
  - 5% – Project Treasury / Grants / Partnerships / Security-Bug-Bounties – via Team and Community discretion

- **Team and Investors (35% – 35,000,000 FXS)**
  - 20% – Team / Founders / Early Project Members – 12 months, 6 month cliff
  - 3% – Strategic Advisors / Outside Early Contributors – 36 months
  - 12% – Accredited Private Investors – 2% unlocked at launch, 5% vested over the first 6 months, 5% vested over 1 year with a 6 month cliff

Utility & Use Case

- ☐ **Does the Token have utility, Can it retain the utility while supplied to FiRM? (10)**

Yes, cvxFXS has utility. It can be used to earn a higher yield on staked FXS tokens, as well as boosted rewards from the Convex Finance protocol. These rewards include a share of the protocol's fees, as well as CVX tokens.

cvxFXS is a relatively new token, so it is difficult to say whether it will retain its utility in the long term. However, the token has a number of features that make it attractive to investors, such as its high yield and boosted rewards. Additionally, the Convex Finance protocol is growing rapidly, which could lead to increased demand for cvxFXS.

Here are some of the factors that could affect the utility of cvxFXS:

- The growth of the Convex Finance protocol: If the Convex Finance protocol continues to grow, it is likely that demand for cvxFXS will increase. This is because cvxFXS is required to earn the highest yield on staked FXS tokens.
- The price of FXS: The price of FXS will affect the yield that can be earned on staked FXS tokens. If the price of FXS increases, the yield on staked FXS tokens will also increase. This could make cvxFXS more attractive to investors.
- The demand for CVX tokens: CVX tokens are used to govern the Convex Finance protocol. If the demand for CVX tokens increases, it is likely that the value of cvxFXS will also increase. This is because cvxFXS holders receive boosted rewards from the Convex Finance protocol, which include a share of the protocol's fees, as well as CVX tokens.

☐ **Liquid or locking feature (10)**

cvxFXS is tokenized veFXS. If a user deposits FXS into Convex, that FXS is locked forever on the platform as veFXS. A tokenized version of veFXS, cvxFXS, is returned to the user at a 1:1 rate. cvxFXS conversion is 1-way. Liquidity pools exist that allow users to swap cvxFXS for FXS tokens.

☐ **Goal of the token, where is value derived from (10)**

Convex purpose is to scoop up as much FXS as possible. cvxFXS value is derived by how much FXS Convex holds and the future prospects of them increasing their bag.

Competitive Analysis

Competitive Markets & Implementation

☐ N/A

Conclusion

Asset Score

The RWG evaluated cvxFXS making use of our in-house comprehensive asset scoring model. This framework evaluates the relative "risk" of cvxFXS as an asset, using wETH as a benchmark, by considering six essential factors: market capitalization, trading volume, price volatility, token distribution, project fundamentals, and token utility. A breakdown of the Total Asset Score (TAS) follows:

Token Contract Address:
https://etherscan.io/address/0xfeef77d3f69374f66429c91d732a244f074bdf74
Assessment date: May 30th, 2023

Component	Link/Rationale	Score
Market Capitalization	MCS=min(10, (sdCRV Supply * sdCRV Price * 200) /(wETH Supply * wETH price)	1.38
DEX Trading Volume	TVS =min(10, (30 Day Avg Token Trading Volume * 200 / 30 Day Avg wETH Trading Volume)	0.45
Price Volatility	PVS =min(10, 10 - (Token Log Price Volatility / wETH Log Price Volatility) * 9)	3.16
Token Distribution	Token Distribution Score = min((1- Token Gini Index) * 10 / (1 - wETH Gini Index);10)	2.01
Project Fundamentals	cvxFXS Collateral on FiRM - See Protocol Analysis, and Audits & Bug Bounties Sections	6.92
Token Utility	cvxFXS Collateral on FiRM - See Collateral Analysis Section	10

Total Asset Score

$$TAS = 1.38 * 0.2 + 0.45 * 0.15 + 3.16 * 0.15 + 2.01 * 0.1 + 6.92 * 0.2 + 10 * 0.2$$

$$TAS = 4.40/10$$

cvxFXS scores exceptionally in *Token Utility*, fairly in *Project Fundamentals* and poorly in *Market Capitalization, DEX Trading Volume*, *Price Volatility* and *Token Distribution*. From this we can draw the following conclusions:

- Token Utility: A high score in token utility implies that cvxFXS tokens have a wide range of use cases and functionality within the associated ecosystem. The higher the score, the more versatile and valuable the tokens are perceived to be. Token utility is crucial as it reflects the demand and practical applications of the asset within its ecosystem.
- Project Fundamentals: A mediocre score in project fundamentals indicates that the underlying project has average attributes in terms of team experience, technology, and roadmap. While not necessarily negative, it suggests that the project may not stand out compared to other projects in terms of its foundational aspects.
- Market Capitalization: A poor Market Capitalization score suggests that the token's overall market value is relatively low compared to wETH. The low market capitalization may indicate limited investor interest or adoption, potentially impacting the liquidity and perceived value of cvxFXS in the market.
- DEX Trading Volume: A poor score indicates that the token experiences limited trading activity on decentralized exchanges. Lower trading volume suggests lower liquidity and may result in challenges when buying or selling cvxFXS without significant price impact or slippage.
- Price Volatility: A poor price volatility score implies that the token's price exhibits significant fluctuations or instability compared to other tokens. Higher price volatility introduces higher risks and uncertainty for investors, as it can lead to unpredictable returns and potential challenges in managing risk exposure.
- Token Distribution: A poor token distribution score suggests that the token's distribution is uneven, potentially indicating a concentration of tokens among a few holders or addresses. Concentrated token distribution raises concerns about centralization, market manipulation risks, and limited liquidity.

Parameter Recommendations

Based on the information presented above, the RWG can now make an informed decision and recommend launch parameters for the cvxFXS market on FiRM. These are presented in the table below.

Supply Ceiling	$1,000,000
Initial Fed Supply	$500,000
Daily Borrow Limit	$200,000
Collateral Factor	60%
Liquidation Factor	50%
Firm Global Supply Ceiling	$33,000,000

Some things to note… These parameters are in line with previous first-time market deployments. The figures are intentionally conservative as this will allow us to gather valuable data, monitor any minor stress test and ultimately provide a more informed recommendation in the future if the market is deemed worthy of parameter adjustments.

The analysis of slippage and price impact figures presented in the table will need to be revised but for the moment indicates that cvxFXS has sufficient liquidity and market depth. The slippage remains relatively low even for larger trades, suggesting that the market can handle increased borrowing demands without significant price disruptions. The price impact figures further support the conclusion that the market has adequate liquidity to accommodate much higher borrowing limits.

The total utility score for cvxFXS reveals that it performs poorly in DEX trading volume, price volatility, token distribution, and market capitalization. However, it scores highly in token utility. While the lower scores in certain areas indicate potential risks, the strong score in token utility suggest a market demand and confidence in cvxFXS.

Periodic stress testing of the market under different scenarios should be conducted to assess the resilience of the system and evaluate the impact of increased borrowing activities. Stress testing helps identify vulnerabilities and potential risks that may not be evident in normal market conditions.

Please note that this document serves as a risk assessment and does not constitute final decisions or policy changes. The recommendations should be reviewed and approved by the appropriate stakeholders before implementation.