Revised Risk Assessment of CRV and cvxCRV FiRM Markets (May '23)

Summary

Market	Total Asset Score	Collateral Factor	Liquidation Factor	Supply Ceiling	Daily Borrow Limit
CRV	8.16	75%	75%	$10,000,000	$1,000,000
cvxCRV	5.98	50%	50%	$6,000,000	$500,000

Background

Since its inception, FiRM has been operating in a "guarded mode," with limited amounts of DOLA available to borrow in the active markets. This approach allowed for careful monitoring and risk assessments of new potential collateral assets, resulting in the launch of additional markets with calibrated parameters. Moving beyond this safeguarded period, the Risk Working Group is proposing periodic parameter adjustments to existing markets to create a more attractive platform. Proposed changes might include adjustments in collateral factors, daily borrow limits, liquidation factors, and market supply ceilings, evaluated by the Risk Working Group to attract new users whilst still maintaining stability and security of the platform.

Methodologies

Asset Scoring Model

The Analytics Working Group, in close collaboration with the Risk Working Group, has devised a comprehensive, in-house asset scoring model. This framework evaluates the relative “risk” of any asset, using wETH as a benchmark, by considering six essential factors:

- market capitalization,
- trading volume,
- price volatility,
- token distribution,
- project fundamentals; and
- token utility.

We derive the Total Asset Score (TAS) by using the following formula :

$$TAS = 0.2 * (MCS + PFS + TUS) + 0.15 * (TVS + PVS + TDS) + 0.1 * PFS$$

Where:

- MCS : Market Capitalization Score

$$MCS = min(10,\ (Token\ Supply\ *\ Token\ Price\ *\ 200)\ /(\ wETH\ Supply\ *\ wETH\ price)\ *\ 10)$$

- TVS : Trading Volume Score

$$TVS = min(10,\ (30\ Day\ Avg\ Token\ Trading\ Volume\ /\ 30\ Day\ Avg\ wETH\ Trading\ Volume)\ *\ 10)$$

- PVS : Price Volatility Score

$$PVS = min(10,\ 10\ -\ (Token\ Log\ Price\ Volatility\ /\ wETH\ Log\ Price\ Volatility)\ *\ 9)$$

- TDS : Token Distribution Score

$$TDS = min((1\ -\ Token\ Gini\ Index)\ *\ 10\ /\ (1\ -\ wETH\ Gini\ Index);\ 10)$$

- PFS : Project Fundamentals Score

Subjective evaluation (1-10) based on team experience, technology, and roadmap

- TUS : Token Utility Score

Subjective evaluation (1-10) based on token use cases and functionality

The weights were determined based on the relative importance of each factor in evaluating token risk. As we build out a registry of TAS for a variety of collateral options and match them with findings from other risk profiling frameworks and methodologies, the RWG will be able to rely more and more on the Asset Scoring Model. As of now, our data indicates any asset with TAS > 7.5 can be deemed an asset carrying a low risk profile. 7.5 > TAS > 5 warrants caution, and, if approved, a “guarded” launch on FiRM. TAS < 5 should seldom be considered worthy of a FiRM market.

RWG Risk Assessments

Risk Assessments conducted by the Risk Working Group (RWG) serve to identify, evaluate, and prioritize risks associated with a specific entity, protocol, collateral, or initiative. The purpose of these assessments is to provide a comprehensive and objective analysis of potential risks and their potential impact on Inverse Finance. This information can then be used to inform risk management strategies and decision-making processes, helping to mitigate or minimize the identified risks. Past assessments include:

- Risk Assessment CRV Collateral on FiRM
- cvxCRV Collateral on FiRM
- Risk Assessment of Active FiRM Markets (Apr '23)

Parameter Recommendations

Parameter recommendations for new markets and changes to existing markets on FiRM are the end result of RWG Risk Assessments and include suggested values for various risk parameters such as the supply ceiling, the collateral factor, daily borrow limit, the liquidation factor, etc. These recommendations serve as a starting point for an informed conversation amongst core contributors and community members alike of Inverse Finance DAO. By providing clear parameter recommendations, the RWG helps to ensure that new markets added to the FiRM protocol are appropriately risk-managed and able to operate in a safe and sustainable manner. This helps to protect the protocol and its users from potential losses and enables the protocol to continue to provide innovative and valuable fixed-rate lending services to the DeFi community.

CRV Market

Asset Scoring Model

May 19th, 2023: The RWG evaluated CRV making use of our in-house comprehensive asset scoring model. This framework evaluates the relative "risk" of CRV 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:

Component	Link/Rationale	Score
Market Capitalization	MCS=min(10, (CRV Supply * CRV Price * 200) /(wETH Supply * wETH price)	10
DEX Trading Volume	TVS =min(10, (30 Day Avg Token Trading Volume * 200 / 30 Day Avg wETH Trading Volume)	8.90
Price Volatility	PVS =min(10, 10 - (Token Log Price Volatility / wETH Log Price Volatility) * 9)	3.33
Token Distribution	Token Distribution Score = min((1- Token Gini Index) * 10 / (1 - wETH Gini Index);10)	6.33
Project Fundamentals	Risk Assessment CRV Collateral on FiRM - See Protocol Analysis, and Audits & Bug Bounties Sections	9.21
Token Utility	Risk Assessment CRV Collateral on FiRM - See Collateral Analysis Section	9.25

Total Asset Score

$$TAS = 10 * 0.2 + 8.90 * 0.15 + 3.33 * 0.15 + 6.33 * 0.1 + 9.21 * 0.2 + 9.25 * 0.2$$

$$TAS = 8.16 / 10$$

CRV scores exceptionally in all categories except *Token Distribution* and *Price Volatility.* From this we can draw the following conclusions:

1. Price Volatility: A poor score in price volatility suggests that CRV price experiences significant fluctuations or instability compared to the benchmark (wETH). This volatility could indicate a higher level of risk associated with CRV's price movements.
2. Token Distribution: A low to medium score in token distribution indicates that CRV tokens may be concentrated among a few holders or addresses, potentially resulting in an uneven distribution of ownership. This concentration can raise concerns about the asset's decentralization, market manipulation risks, or limited liquidity. In our instance, given our close relationship with Mich, founder of Curve, this is not of concern.
3. Market Capitalization: A high score in market capitalization suggests that CRV has a large overall market value relative to wETH. A substantial market capitalization indicates that CRV has gained a considerable level of adoption or popularity.
4. Trading Volume: A high score in trading volume indicates that CRV experiences a robust level of trading activity compared to wETH. Higher trading volume generally implies better liquidity and market interest, making it easier for investors to buy or sell CRV without significant price impact or slippage. This is also important in the context of liquidations.
5. Project Fundamentals: A high score in project fundamentals suggests that CRV's underlying project has strong attributes, such as an experienced team, solid technology, and a promising roadmap. This positive evaluation indicates that the project has a strong foundation and potential for success.
6. Token Utility: A high score in token utility implies that CRV's tokens have diverse 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 essential as it reflects the demand and practical applications of CRV within its ecosystem.

Slippage/Price Impact Sims

Trade	CRV	USDC	DOLA	Slippage	Price Impact (%)
$100,000	120447	99505	99737	0.26	0.62
$250,000	301053	248470	249027	0.39	0.68
$500,000	602107	496757	497795	0.44	0.98
$1,000,000	1204217	992199	994058	0.59	3.58
$2,000,000	2408434	1950534	1953435	2.33	9.68
$4,000,000	4816868	3667124	3670274	8.24	19.73
$6,000,000	7225303	5194796	5196467	13.39	28.05

$8,000,000	9633743	6592537	6591333	17.61	35.11
$10,000,000	12044443	7784656	7779616	22.20	41.16

Parameter Recommendations

Based on the risk analysis conducted, it is concluded that increasing the market ceiling to $10,000,000 and the daily borrow limit to $1,000,000 for the CRV market is justifiable. The analysis of slippage and price impact figures indicates sufficient liquidity and market depth to support higher borrowing limits. The strong total utility score for CRV further validates the market's confidence and demand for borrowing CRV.

- Slippage and Price Impact: The analysis of slippage and price impact figures presented in the table indicates that CRV 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 higher borrowing limits.

- Total Utility Score: The total utility score for CRV reveals that it performs well in market capitalization, trading volume, project fundamentals, and token utility. This indicates strong market confidence and potential for continued growth. The robust utility score provides further support for the recommendation to increase the market ceiling and daily borrow limit.

- Collateral Factor and Liquidation Factor: It is important to note that the proposed changes do not affect the collateral factor and liquidation factor. The collateral factor, currently set at 75%, ensures that borrowers maintain sufficient collateralization to protect against potential defaults. The unchanged liquidation factor provides a mechanism to mitigate the risk of liquidation in case of a significant drop in collateral value. These risk mitigation measures will remain in place, maintaining a balance between borrowing capacity and risk management.

- Ongoing Monitoring: Regular monitoring of market dynamics, liquidity, and price stability is essential to identify any emerging risks or potential disruptions. Ongoing surveillance and analysis will allow prompt actions to address any issues that may arise.

- Stress Testing: 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.

cvxCRV Market

Asset Scoring Model

May 19th, 2023: The RWG evaluated cvxCRV making use of our in-house comprehensive asset scoring model. This framework evaluates the relative "risk" of cvxCRV 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:

Component	Link/Rationale	Score
Market Capitalization	MCS=min(10, (CRV Supply * CRV Price * 200) /(wETH Supply * wETH price)	7.72
DEX Trading Volume	TVS =min(10, (30 Day Avg Token Trading Volume * 200 / 30 Day Avg wETH Trading Volume)	2.51
Price Volatility	PVS =min(10, 10 - (Token Log Price Volatility / wETH Log Price Volatility) * 9)	3.96
Token Distribution	Token Distribution Score = min((1- Token Gini Index) * 10 / (1 - wETH Gini Index);10)	1.82
Project Fundamentals	cvxCRV Collateral on FiRM - See Protocol Analysis, and Audits & Bug Bounties Sections	6.92
Token Utility	cvxCRV Collateral on FiRM - See Collateral Analysis Section	10

Total Asset Score

$$TAS = 7.72 * 0.2 + 2.51 * 0.15 + 3.96 * 0.15 + 1.82 * 0.1 + 6.92 * 0.2 + 10 * 0.2$$

$$TAS = 6.08 / 10$$

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

1. DEX Trading Volume: A poor score in DEX trading volume suggests that cvxCRV has relatively low trading activity on decentralized exchanges. This may indicate limited liquidity and lower market interest, potentially making it more challenging to buy or sell cvxCRV without price impact or slippage.
2. Price Volatility: A poor score in price volatility indicates that cvxCRV's price experiences significant fluctuations or instability. This volatility may make cvxCRV less attractive to investors and can introduce higher risks and uncertainty.
3. Token Distribution: A poor score in token distribution suggests that cvxCRV tokens may be concentrated among a few holders or addresses. This concentration raises concerns about the asset's decentralization, potential market manipulation risks, and limited liquidity. In our instance, given our close relationship with C2TP, founder of Convex, this is less of a concern.
4. 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.
5. Market Capitalization: A high score in market capitalization suggests that cvxCRV has a large overall market value. This indicates that the asset has gained significant investor interest and confidence, potentially due to factors such as perceived adoption, network effects, or market dominance.
6. Token Utility: A high score in token utility implies that cvxCRV 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.

Slippage/Price Impact Sims

Trade	cvxCRV	CRV	USDC	DOLA	Slippage	Price Impact (%) cvxCRV-> CRV	Price Impact (%) cvxCRV -> DOLA
$100,000	128587	120712	99795	100028	0	0.49	1.11
$250,000	321468	300400	248233	248790	0.48	0.66	1.34
$500,000	642937	595586	491600	492628	1.47	0.98	1.96
$1,000,000	1285875	1162312	957409	959217	4.08	1.66	5.24
$2,000,000	2570621	2054270	1674122	1676792	16.16	3.31	12.99

$4,000,000	5141242	2625919	2103119	2106068	47.35	8.24	27.97
$6,000,000	7711864	2726049	2179168	2182219	63.63	16.77	44.82
$8,000,000	10282485	2760038	2204850	2207916	72.40	30.86	65.97
$10,000,000	12853106	2776480	2218083	2221155	77.79	49.84	91.00

Parameter Recommendations

Based on the risk analysis conducted, it is concluded that increasing the market ceiling to $6,000,000 and the daily borrow limit to $500,000 for the cvxCRV market is justifiable. The analysis of slippage and price impact figures indicates sufficient liquidity and market depth to support higher borrowing limits. While cvxCRV exhibits weaknesses in DEX trading volume, price volatility, and token distribution, the strong market capitalization and token utility scores suggest a market demand for cvxCRV.

- Slippage and Price Impact: The analysis of slippage and price impact figures presented in the table indicates that cvxCRV 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 higher borrowing limits.

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

- Collateral Factor and Liquidation Factor: It is important to note that the proposed changes do not impact the collateral factor and liquidation factor. The collateral factor, currently set at its existing value, ensures that borrowers maintain sufficient collateralization to protect against potential defaults. The unchanged liquidation factor provides a mechanism to mitigate the risk of liquidation in case of a significant drop in collateral value. These risk mitigation measures will remain in place, maintaining a balance between borrowing capacity and risk management.

- Ongoing Monitoring: Regular monitoring of market dynamics, liquidity, and price stability is essential to identify any emerging risks or potential disruptions. Ongoing surveillance and analysis will allow prompt actions to address any issues that may arise.

- Stress Testing: 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.