

Revised Risk Assessment of INV FiRM Market (November '23)

TL;DR

Market	Total Asset Score	Collateral Factor	Liquidation Factor	Liquidation Incentive	Liquidation Fee	Supply Ceiling	Daily Borrow Limit	Minimum Debt Amount
INV	5.06	30%	20%	10%	10%	420,000	25,000	2000

The RWG approves a **Supply Ceiling** increase from 350,000 DOLA to 450,000 DOLA, and the introduction of a **Liquidation Fee** (set at 10%). We recommend all other market parameters to remain the same. See *INV Market* section for more information.

Background

As of November 27th, 2023, the INV market is FiRM's 5th most utilized market, with \$3.44M in deposits (\$7.15M in total including staked INV) and \$350k in borrows, and ranked 1st in unique open positions, 19. INV FiRM users also have, on average, a borrow limit % of 36.11%, the lowest amongst collaterals. This figure is in line with our predicted user behavior outlined in the original INV risk assessment document.

However this was not always the case, as our previous largest borrower, wallet address ...8e43, exited their entire position last month. This user exhibited abnormal behaviour (relative to other borrowers) throughout their tenure as an INV holder; taking on significant risk whilst leveraging up and deleveraging and being [liquidated 9 times](#) in the process. Now that this user has fully exited and has been replaced (in borrow position size) by wallet ...f430, an entity well known by the core team and known to be fully aligned with the DAO, the RWG is ready to compile a revised risk assessment on staked INV collateral on FiRM. Excluding wallet ...f430, the INV market is composed of 18 unique users, with a total of \$730k INV in deposits, 95k DOLA in debt, and an average borrow limit of 43.47%. These are very encouraging figures and ones we hoped for as they signal both an strong desire and a prudent approach to borrowing.

Since its inception, the INV market has yet to undergo a parameter adjustment via governance proposal. This approach allows the Risk Working Group to propose periodic parameter adjustments to existing markets based on a variety of factors including utilization of the market, changes in risk profile of the underlying asset, etc. Proposed changes might include adjustments in collateral factors, daily borrow limits, liquidation factors, and market supply ceilings and are made 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.

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 of INV FiRM Market (September '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.

INV Market

Asset Scoring Model

November 27th, 2023: The RWG evaluated INV making use of our in-house comprehensive [asset scoring model](#). The TAS came out to be 5.06, a decrease from past scores listed below.

- 5.39 on September 15th, 2023
- 5.23 on May 17th, 2023

A breakdown of the Total Asset Score (TAS) follows:

Component	Link/Rationale	Score
Market Capitalization	$MCS = \min(10, (INV \text{ Supply} * INV \text{ Price} * 200) / (wETH \text{ Supply} * wETH \text{ price}))$	0.52
DEX Trading Volume	$TVS = \min(10, (30 \text{ Day Avg Token Trading Volume} * 200 / 30 \text{ Day Avg wETH Trading Volume}))$	0.26
Price Volatility	$PVS = \min(10, 10 - (Token \text{ Log Price Volatility} / wETH \text{ Log Price Volatility}) * 9)$	2.82
Token Distribution	$\text{Token Distribution Score} = \min((1 - \text{Token Gini Index}) * 10 / (1 - wETH \text{ Gini Index}); 10)$	4.96
Project Fundamentals	N/A	10
Token Utility	N/A	10
Total Asset Score		
$TAS = 0.52 * 0.2 + 0.26 * 0.15 + 2.82 * 0.15 + 4.96 * 0.1 + 10 * 0.2 + 10 * 0.2$		
$TAS = 5.06 / 10$		

Project Fundamental and *Token Utility* were both scored 10 without an accompanying analysis. This is because INV real yield and DBR streaming are sufficient markers to obtain such a score, and because, as core contributors, the RWG can't assess components pertaining to the *Project Fundamentals* score objectively/without bias. In general, components are meant to be risk-measures for an asset and, since INV's *Project Fundamental* and *Token Utility* pose no risk to Inverse Finance, they should both score accordingly.

Elsewhere, INV scored lower in Price Volatility, Token Distribution compared to last assessments, while Market Cap, and Trading Volume scores have remained mostly the same. From this we can draw the following conclusions:

- **Price Volatility:** A lower score in price volatility suggests that INV price has experienced more significant fluctuations or instability compared to the benchmark (wETH) in the recently studied period. The below chart maps INV price in the three month expressed in ETH, and depicts the volatility. Notably, this volatility is initially to the upside, which can be attributed to the INV market launch on FiRM, and then to the downside, which can be attributed to wallet ...8e43 unwinding their large position.

Inverse Finance Price Chart (INV)



- **Token Distribution:** A poorer score in token distribution suggests that INV tokens may be more concentrated among fewer holders or addresses. This elevated concentration may raise concerns about the asset's decentralization, potential market manipulation risks, and limited liquidity. In our instance, a worsened Token Distribution score is likely due to wallet ...f430 identified in the Background section. Upon confirmation of the OTC swap outlined in [Proposal 134](#), this wallet accumulated a substantial amount of INV, which they then staked on FIRM (xINV). Token distribution will be further explored in the *Holders* section below.

Holders

INV Contract Address:

<https://etherscan.io/token/0x41d5d79431a913c4ae7d69a668ecdfe5ff9dfb68>

Transfers	Holders	Info	DEX Trades	Contract	Analytics	Comments
Token Holders Chart						
Top 1,000 holders (From a total of 3,572 holders)						
First < Page 1 of 20 > Last						
Rank	Address	Quantity	Percentage	Value	Analytics	
1	0x1637e4...f7DCD61B	248,597.586359357181435607	51.7912%	\$8,429,944.15	Analytics	
2	Inverse Finance: Anchor Treasury	51,213.768036620660325891	10.6695%	\$1,736,658.87	Analytics	
3	0x9D9677...83379770	18,310.7434005968383647	3.8147%	\$620,917.31	Analytics	
4	0x86d944...63d8B6Ea	18,310.7434005968383647	3.8147%	\$620,917.31	Analytics	
5	0xA3B7ef...4fB2A689	18,064.645283395466131	3.7635%	\$612,572.12	Analytics	
6	0x2a2c0e...3e888801	17,747.1459693514969266	3.6973%	\$601,805.72	Analytics	
7	0x161E5b...Ff3f2c77	15,177.19988322877851254	3.1619%	\$514,658.85	Analytics	
8	0xEF9dB0...DaC5dA40	12,947.666319306300699213	2.6974%	\$439,055.36	Analytics	
9	0xC7DE47...6D18b19a	12,946.958002862705864913	2.6973%	\$439,031.35	Analytics	
10	Coinbase 10	10,996.123774300265910672	2.2909%	\$372,878.56	Analytics	

- # of holders (3572) is up 101 since September, 2023 (3471) and up is 344 since May, 2023 (3228).
- Staking Contract (Address #1) makes up 51.79% of all INV. Coinbase-labelled address rank #10, MEXC is #13, Balancer vault is ranked #15.

xINV Contract Address:

<https://etherscan.io/token/0x1637e4e9941D55703a7A5E7807d6aDA3f7DCD61B>

Transfers	Holders	Info	Contract	Analytics	Comments
Token Holders Chart					
A total of 696 token holders					
First < Page 1 of 14 > Last					
Rank	Address	Quantity	Percentage	Analytics	
1	0xc3e40E...A77787B0	13,198.425855511147425296	32.2059%		
2	0x53039e...Ebf5eDF5	6,046.786674246630878639	14.7549%		
3	0x2AfB13...a8EE42aE	1,546.134437310157091517	3.7728%		
4	0x712CEa...aa3907BF	1,330.407391693731272658	3.2464%		
5	0xE0cB6a...660d6b02	1,001.33394036324665431	2.4434%		
6	0xa1696F...4759db60	759.598321701361491726	1.8535%		
7	0xEfB372...81Ab272E	525.830841885249001211	1.2831%		
8	0x4182A4...Eeced3b4	512.105694379855487507	1.2496%		
9	0xE64019...3c5E675b	509.565128360596358243	1.2434%		
10	0x168b7c...76EdeDEc	494.467829276043973097	1.2066%		

- # of holders is 696 (up 1 since September).
- Holders above \$1000 are 274 (1xINV:6.06INV).
- Top Address holds 32.05%. Previous snapshot in September saw the top address hold 18.34%. This is due to recent OTC swap outlined in [Proposal 134](#)
- 3 Addresses hold >50% of xINV (down from 8 addresses in September).
- 206 xINV [stakers on FiRM](#), up from 185 in September.
















FiRM Market Top Users:

Market	Borrower	Deposits	Max Debt	Debt	In Shortfall?	Seizable	Borrow Limit
×	INV	×			×		
INV	0x759a...f430	80.10k (\$2.7M)	810.75k	255.04k	No	-	31.46%
INV	0x0447...782f	3.00k (\$101.25k)	30.37k	16.28k	No	-	53.60%
INV	Edo	2.82k (\$95.23k)	28.57k	13.92k	No	-	48.74%
INV	0xBd8b...D826	1.64k (\$55.46k)	16.64k	10.70k	No	-	64.32%
INV	0xFffF...3B55	1.67k (\$56.48k)	16.94k	9.03k	No	-	53.27%
INV	TheAlienTourist	1.65k (\$55.57k)	16.67k	5.00k	No	-	29.99%
INV	0x21Cf...312A	1.05k (\$35.29k)	10.59k	5.00k	No	-	47.22%
INV	0x8061...4093	977.41 (\$32.97k)	9.89k	5.00k	No	-	50.54%

Delegates

Delegate Top 100

Top delegates by voting weight - Updated every 15 min

Rank ^		Delegators	Proposals Voted	Votes	Vote Weight
1	 0x2CBA...2dfD	4	113	80103.30	41.68%
2	 Deployer	10	14	36701.05	19.10%
3	 CryptoHarry	40	141	11752.17	6.12%
4	 0x2CBA...2dfD	5	32	11160.67	5.81%
5	 fridged.eth	2	3	6077.25	3.16%
6	 Mason	9	28	4303.35	2.24%
7	 PatB	28	104	4078.34	2.12%
8	 0x0447...782f	4	22	3280.64	1.71%
9	 0xEfB3...272E	1	16	3192.62	1.66%
10	 0x4182...d3b4	1	5	3108.05	1.62%
11	 Edo	4	35	3065.85	1.60%
12	 Zee	2	5	2166.81	1.13%
13	 0x1089...6190	2	2	2079.37	1.08%
14	 0x71F9...Fad2	2	1	2036.98	1.06%
15	 BenLavabo	61	44	1740.97	0.91%

- Top 2 hold >50% of voting power.
- Top delegate can bring about stalemates in governance. Gov guardian role can protect against top delegate leading all DAO operations according to their desire, but cannot impede stalemates.

Liquidity

LP	Platform	TVL (\$)	INV Depth (#)
INV<>DOLA<>DBR	Curve	1,293,066	12,946.96
INV<>USDC<>ETH	Curve	874,734	8,651.34
INV<>DOLA	Balancer	137,602	2,054.49
INV<>DOLA	UniswapV3	116,354	1,740.49
INV Liquidity		\$2,421,756 (+50.2%)	25,393.28 (+7.6%)

Figures are from November 27th, 2023. Previous Snapshot date: September 22nd, 2023.

INV's deepest LPs (presented in the table above) account for ~\$2.4M in total TVL. The Curve triDBR LP is now the deepest source of on-chain liquidity source for INV with ~\$1.3M TVL.










[Inverse Finance DAO PoL](#) accounts for:

- 99.7% of the triDBR LP,
- 0% of the Balancer LP's TVL,
- 52.6% of the tricryptoINV LP,
- 94.5% of the UniswapV3 LP

Overall, the DAO holds 19,121.24 of the 25,393.28 INV (75%) in these deepest LPs. This liquidity can be assumed to be sticky, and guarantees baseline on-chain depth for INV. However, this also suggests INV liquidity distribution is currently poor and is thus an additional cause for concern.

A follow-up analysis will study INV liquidity providers (data collected for stakers on Convex Finance + Balancer info) if warranted.

INV's CEX liquidity is concentrated into three exchanges and acts to support on-chain DEX liquidity through arbitrage opportunities. Coinbase leads with the highest depth and volume as seen below.

#	Exchange	Pair	Price	Spread	+2% Depth	-2% Depth	24h Volume -	Volume %	Last Updated	Trust Score
1	 Coinbase Exchange	INV/USD	\$28.39	0.39%	\$18,858	\$15,022	\$62,062	49.09%	Recently	
6	 MEXC	INV/USDT	\$28.28	1.12%	\$4	\$23	\$26,292	20.79%	Recently	
4	 Gate.io	INV/USDT	\$28.72	1.96%	\$195	\$165	\$24,073	19.04%	Recently	
7	 Gate.io	INV/ETH	\$28.38	4.49%	-	-	\$8,973	7.10%	Recently	-
5	 CoinEx	INV/USDT	\$28.74	1.96%	\$1	\$1	\$2,811	2.22%	Recently	

Price Impact and Slippage Simulations (Nov. 24th, 2023)

The following table presents a simulation analysis on price impact and trade slippage for varying levels of INV sold. The analysis was carried out using aggregators, and thus includes all sources of on-chain INV liquidity. The original source can be found [here](#).

INV Sold	INV Sold \$	Price Impact	DOLA Received	Trade Slippage
1,070	\$37,109	-7.9%	35,486	-4.4%
1,250	\$43,351	-11.0%	41,147	-5.1%
2,140	\$74,218	-14.7%	68,005	-8.4%
2,500	\$86,703	-20.0%	78,360	-9.6%
3,210	\$111,326	-20.7%	97,985	-12.0%

3,990	\$138,378	-27.8%	118,148	-14.6%
4,274	\$148,227	-26.1%	125,300	-15.5%
5,320	\$184,503	-34.4%	150,476	-18.4%
5,342	\$185,266	-30.9%	150,986	-18.5%
6,410	\$222,306	-35.3%	174,914	-21.3%
6,649	\$230,595	-40.2%	180,048	-21.9%
7,479	\$259,380	-39.2%	197,258	-24.0%
7,979	\$276,720	-45.2%	207,262	-25.1%
8,333	\$288,998	-42.9%	214,035	-25.9%
9,309	\$322,846	-49.7%	232,073	-28.1%
9,375	\$325,135	-46.2%	233,214	-28.3%
10,417	\$361,273	-49.2%	251,469	-30.4%
10,640	\$369,007	-53.6%	255,530	-30.8%
11,300	\$391,896	-52.0%	266,078	-32.1%
11,970	\$415,133	-57.0%	276,243	-33.5%
12,195	\$422,936	-54.5%	279,566	-33.9%
13,211	\$458,172	-56.9%	294,663	-35.7%
13,298	\$461,189	-60.1%	296,122	-35.8%
14,228	\$493,443	-59.0%	309,018	-37.4%
14,628	\$507,315	-62.9%	314,730	-38.0%
15,244	\$528,679	-61.1%	322,609	-39.0%
15,957	\$553,406	-65.4%	332,045	-40.0%
16,260	\$563,915	-62.9%	336,572	-40.3%
17,170	\$595,474	-64.7%	346,751	-41.8%
17,287	\$599,532	-67.6%	346,025	-42.3%
17,857	\$619,300	-66.3%	352,489	-43.1%
18,617	\$645,658	-69.7%	361,102	-44.1%
19,947	\$691,784	-71.5%	375,249	-45.8%
21,275	\$737,840	-73.2%	383,731	-48.0%

Liquidators, for an eventual INV market on FiRM, would opt for the optimal INV->DOLA route. Encouragingly, slippage figures have improved since INV liquidity was last studied on September 20th, 2023. However, figures for larger amounts are still high and a cause for concern. The ensuing price impact for a liquidation event incurring high slippage could cause a liquidation cascade, and leave INV in an irreparable state. Setting conservative parameters for the market can help mitigate this risk. One above all is liquidation factor. At it's current setting of

20%, the market experienced [9 liquidations](#) within a two week period without it resulting in a cascading liquidation.

Figures from a previous simulation carried out on September 22nd, 2023 are presented below.

INV Sold	INV Sold \$	Price Impact (%)
995	25,002	-7.41
2150	54,025	-16.54
2550	64,076	-19.36
4000	100,512	-28.90
7650	192,229	-39.18
8300	208,562	-46.57
12500	314,100	-59.05
13800	346,766	-66.65
20800	522,662	-77.81
23700	595,534	-83.45

Figures are from September 22nd, 2023.

When comparing the two snapshots, we notice a present day improvement in price impact. For example, as of November 24th, a ~\$86.7k INV sell order resulted in 20% price impact, whereas on September 22nd, a ~\$64k INV sell order resulted in a -19.36% price impact.

Parameter Recommendations

Based on the findings of our research presented above, we approve the request to increase the supply ceiling for the INV market from 350,000 DOLA to 420,000 DOLA. Market activity suggests there is an appetite for the market at current collateral factor value, and average borrow limit figures suggest INV holders are cautious with their capital.

Supply Ceiling Adjustment:

- **Current:** 350,000 DOLA
- **Proposed New Limit:** 450,000 DOLA
 - **Rationale:** The proposal to adjust the supply ceiling to 420,000 DOLA is driven by the evaluation of the potential impact on the INV price in a worst-case scenario where the market is fully utilized by a single borrower. Under the current

parameters, a liquidation factor of 20% implies that, should the market reach its maximum utilization, a forced liquidation event would need to sell off 20% of the total borrowed amount to restore collateral balance. For a fully utilized ceiling of 420,000 DOLA, this translates to a sell pressure of 84,000 DOLA (420,000 DOLA multiplied by the liquidation factor of 0.2). Our price impact simulations indicate that selling \$84,000 worth of INV would result in less than a 20% price impact on INV. To ensure the stability of the market and to prevent a potential liquidation cascade, it is safe to assume that the maximum theoretical price impact from such a sell-off remains below the liquidation threshold parameter. By maintaining the price impact below this threshold, we can more easily guarantee the market can absorb the most significant sell order without triggering a cascade of liquidations. Note: CEX liquidity acts as a margin of safety as it helps absorb price impact through arbitrage.

Introduction of a Liquidation Fee:

- **Current:** 0%
- **Proposed Liquidation Fee:** 10%
 - **Rationale:** The implementation of a liquidation fee aims to enhance market stability by promoting, in tandem with the liquidation incentive parameter, responsible market user behavior.
 - **Clarification:** A liquidation fee (expressed as a percentage) is a charge imposed when liquidating undercollateralized loans, which is awarded to the operator of the lending market and aids with contributing to protocol revenue. This parameter should not be confused with the liquidation incentive (also expressed as a percentage), which is a set-able parameter in the form of a fee charged to short-falling loans that aims to incentivize liquidators to participate in the liquidation process.

Unchanged Parameters:

- **Collateral Factor, Liquidation Factor, Liquidation Incentive, and Minimum Debt Amount, Daily Borrow Limit:** No changes recommended at this time.
 - **Rationale:** The current levels have been effective in maintaining market equilibrium and managing risk.

Continued risk assessment and adjustments to market parameters are crucial to maintaining market stability. The proposed increases in supply ceiling indicate confidence, but they must be balanced with the potential risks of concentrated token distribution and governance power.

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.