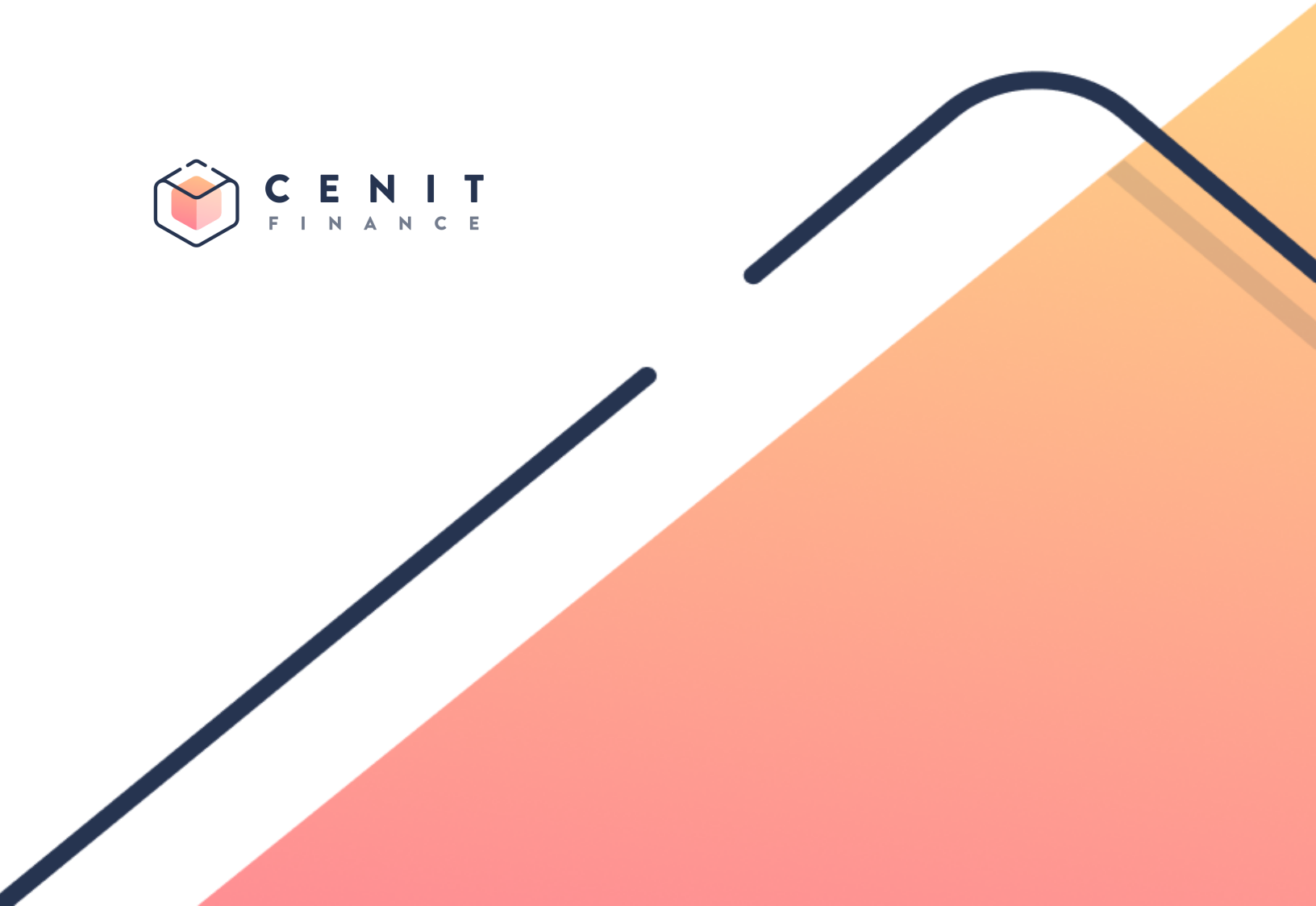
FRAKT Risk Management assessment based on Cenit's agent-based simulation

Date: *October 2022*



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NFT-lending & FRAKT Protocol Background

FRAKT is a Solana based NFT-lending protocol that allows its users to obtain liquidity from their NFTs. By using NFTs as collateral, users are able to take loans, while the lenders get guarantees of repayment and earn borrowing fees.

As is the case with other trustless lending initiatives, it is possible for NFT-lending protocols to face extreme market conditions when their borrowers have no incentive to repay their debts and default on their loans. In order to avoid this situation, NFT-lending protocols make use of over-collateralized loans, but still some questions remain difficult to answer, such as which loan-to-value (LTV) and liquidation thresholds/bonuses should be set.

On top of this, NFT-based lending must address further risks due to the far more illiquid, volatile, and hard to measure market conditions for NFTs when compared to traditional fungible-token-based lending protocols.

FRAKT is the leading NFT-based lending protocol in the Solana blockchain. Currently, FRAKT offers two main types of loans for their users: perpetuals and flips.

For perpetual loans, a separate liquidity pool exists for each allowed blue-chip collection. As their name suggests, perpetual loans have no expiration, as long as the value of the NFT collateral deposited by the borrower remains above their outstanding debt (plus a margin of safety), which accumulates over time. At the time of writing the initial LTV (loan-to-value ratio) accepted for an NFT collateral is up to 40%.

FRAKT offers flip loans too, where the user can take loans for a pre-fixed amount of time (7 - 14 days). With this kind of loan, liquidation can only occur by the borrower not paying back the loan by the end of the fixed loan duration. Therefore, for these loans there are no liquidation thresholds. There is a single lending pool against which these loans are taken, accepting NFTs from a wide variety of collections as collateral. Allowed LTV for the loan depends on the NFT provided as collateral, within a range of 20-50%, depending on the market data of that collection.

Market Risks and Protocol Risk Parameters

Market risk parameters

The value of an NFT is unclear due to its uniqueness, making it a hard problem to solve. The consensus of the industry, highly debated, is to estimate the worst-case value of an NFT based on the floor price of the collection it belongs to [1]. For our analysis we adopt this pricing methodology, as FRAKT uses this pricing system to evaluate liquidation prices and loan-to-value ratios.

Despite this difference, market risks in NFT-lending are basically the same described in [2,3] for any other assets. NFT-lending therefore faces the risks of sudden shocks that leave the loan positions not properly collateralized. We take into account the **volatility** of each asset (collection) based on the definition of floor price and introduce it into our price path generation engine.

Sudden movements are directly related to the liquidity of the market. As a result, the **volume of sales** of each collection of NFTs is a critical parameter too.

Since the drop in floor price, as a proxy for value, is caused mainly by listing NFTs, and not necessarily by their sale, in the simulations we shall define and monitor the **slippage effect on NFTs as the change in the price that the market suffers based on a sudden change in the number of NFTs listed in the secondary market.**

Protocol Risk Parameters

Now that DeFi is increasing the access to leverage on NFTs, additionally to price volatility, the risk of liquidation cascades is a real danger. NFT-backed loan liquidations would result in the liquidators potentially listing the repossessed NFTs in the secondary market at floor price or below, in order to obtain a quick profit. This could cause drops in collection floor price and thus further liquidations by bringing loans closer to liquidation thresholds.

This liquidation cascade risk can be monitored based on the amount of NFTs of a specific collection that is being **utilized as collateral.**

Finally, the **debt** of the market is also another parameter to take into account to understand the risks of triggering the liquidation cascades commented before. FRAKT measures its debt

through the **loan health** parameter**.** This parameter determines the threshold of debt accepted to liquidate a loan, as a result, it is only present in perpetual loans. The loan health is directly related to the margin of safety and debt.

FRAKT parameters.

FRAKT has a set of parameters that allow the protocol to adapt to different market/asset conditions [4].

Maximum Loan to Value - The maximum LTV sets the maximum amount of capital that can be loaned against a given asset. The higher the LTV, the higher capital efficiency for borrowers. Indirectly, this also benefits lenders, since more borrowers will borrow more capital, leading to higher utilization and capital efficiency for the lending pool. However, it also increases the chance of default.

Grace Period - It is the amount of time that a borrower is given to repay their debt once it reaches the time limit (for flip loans) or the price limit (for perpetual loans). In FRAKT perpetual loans the start of the grace period is triggered by the debt reaching the liquidation threshold (which is equivalent to reaching a loan health of 0). In flips, the grace period starts when the loan exceeds its time limit.

Margin of safety - It is a parameter used to determine the Loan's health [reference the site]. The margin of safety has the role of liquidation threshold because it sets harder/softer conditions for the loans to get liquidated. It also has a role of liquidation bonus since liquidators will get access to more or less valuable collateral based on this parameter,

Objective of the analysis

The goal of this analysis is to evaluate the FRAKT market risks and help find the best set of protocol parameters to mitigate that risk, for each asset and pool and for different market scenarios. These parameters include:

- Maximum Loan to Value
- Grace Period
- Margin of safety

To do so we carry out thousands of simulations with a various setups of risk parameters:

- Volatility
- Volume of sales
- Loan Health
- Number of loans backed by a given collection

From each of those simulations, as in [4], we define the protocol failure condition when there is, at any point in the simulation, a defaulted loan for which its liquidation is not incentivised. That is, a loan in which a potential liquidator with enough funds available would not perceive an economic incentive to repay it under the current market conditions.

In addition to the failure condition ratio, we measure risk with two different variables: Value at Risk (VaR) and Liquidators at Risk (LaR).

- VaR is defined as the 5th percentile of Profit and Losses (PnL) of the lending pool at the end of the simulations (debt on non liquidated loans). This monitors the bad debt that the protocol might have because of non incentivized liquidations.
- LaR is the 5th percentile of realized PnL of liquidators (value of sales of NFTs in the secondary market minus debt repaid for those NFTs). LaR measures the risk of the liquidators since, most of the time, they will not be able to instantly sell the asset, and therefore be exposed to market risks.

Simulation Setup

Our simulations consist on a agent-based model that can be split in three different parts:

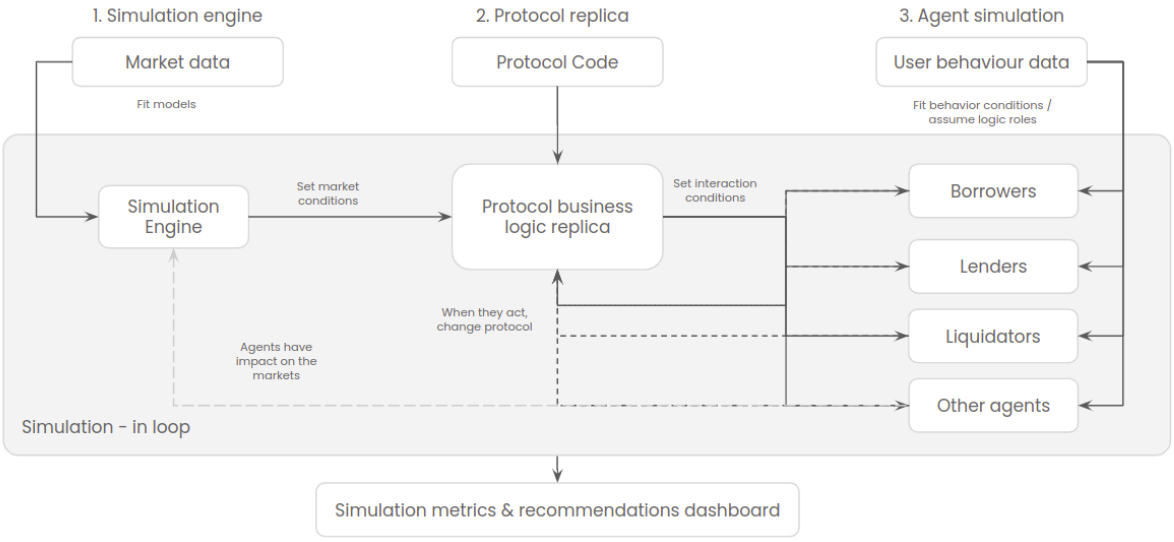
Market simulation. Simulates the market data external to the protocol. The price of an asset is determined by Gaussian Brownian Motion simulations. Based on price changes we are able to determine the changes in NFTs listed in the market.

In addition, since lending market liquidations add selling pressure to the secondary market, they can modify the prices of the assets under management. This impact that FRAKT listings have over the secondary market is also modeled by the slippage the market might suffer.

Agent behavior. Simulates how each of the agents will behave in terms of incentives, conditions of loans, etc. There are 4 agents relevant to the operation of FRAKT.

- Lenders: Can decide in which of the pools, flips or any of the perpetuals, to add liquidity.
- Borrowers. Are allowed to get liquidity from their NFTs as long as the asset has been whitelisted by FRAKT protocol. The conditions of loan duration are determined by the pool they decide to borrow against. The user is able to set the LTV they would like to have, with the constraint of the maximum LTV, set by the protocol.
- Liquidators: When the liquidation of a loan occurs, and after a grace period in which the borrower is able to repay the debt with a penalty, daily raffle winners can opt to repay the debt and obtain the NFT, usually still at a discount relative to market price. Liquidators can have an impact on the collection price if they try to resell the collateral.
- Oracles: provide the floor price of each of the collections.

Protocol replica. A replica of the protocol to interact with the simulation engine. The replica interacts with the market data and the user activity to determine the status and conditions of each of the loans.



Market modeling: time series simulation

Price modeling: Natural random paths. Our simulations consist of a time series of 30 days in which each timestep represents an hour. To get realistic possible future prices against which to test the protocol, our simulations generate stochastic collection floor price paths with Brownian motion. This motion incorporates the price volatility and correlation of the previous 14 days for each of the assets to model.

$$P_t = P_0 e^{\left(r - \frac{1}{2}\sigma_t^2\right)t + \sigma_t W_t}$$

In the formula above, P represents the price value, r is the price drift (which is set to 0 in order not to bias price movements upwards or downwards), σ is the price volatility and W is the stochastic term.

This last term introduces the randomness in price paths. For the isolated perpetual pools simulations, this is sampled from a univariate normal distribution. However, for the flips pool simulations, with multiple possible assets as collateral, it is sampled from a multivariate normal distribution that takes into account the price correlation between the various assets.

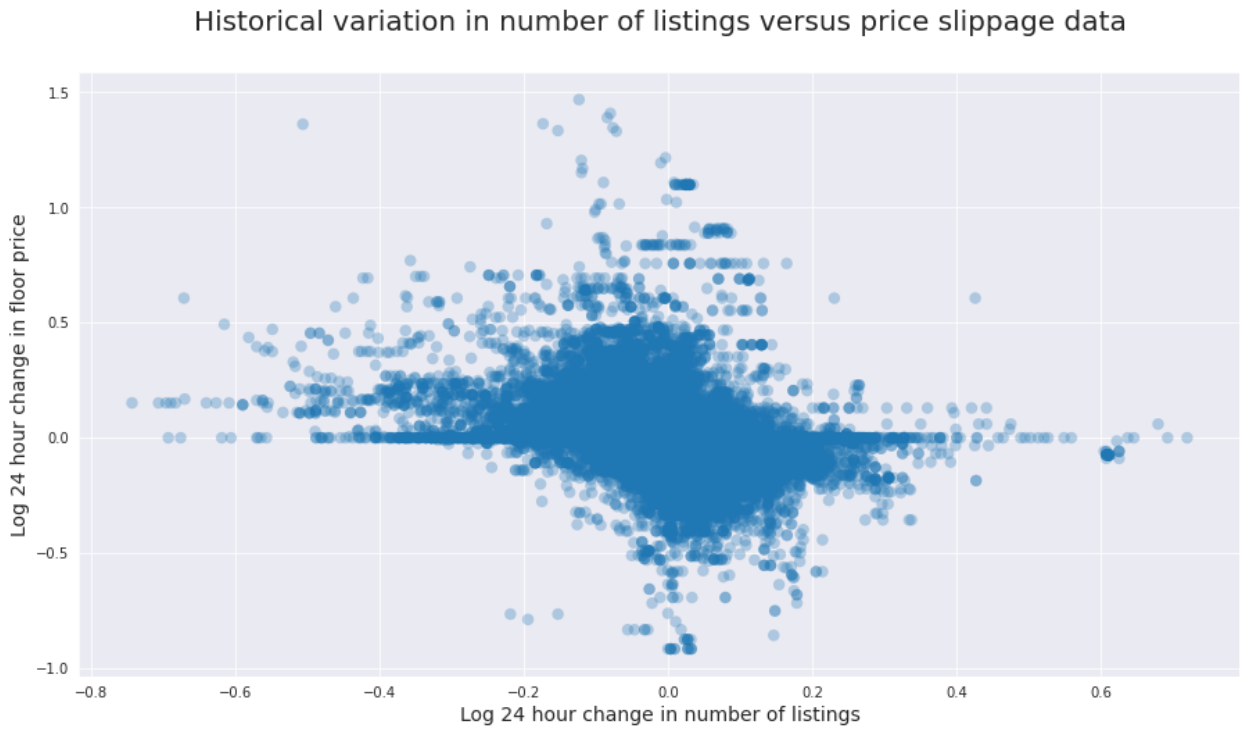
We set the initial price of the simulation as the floor price for a given collection in the initial date selected.

NFT listed in secondary market modeling. Changes in the number of NFTs listed have an impact on the price and vice versa. We relate these variations through the following model:

$$Ln(\frac{N_{t-1}}{N_t}) = R * Ln(\frac{P_{t-1}}{P_t})$$

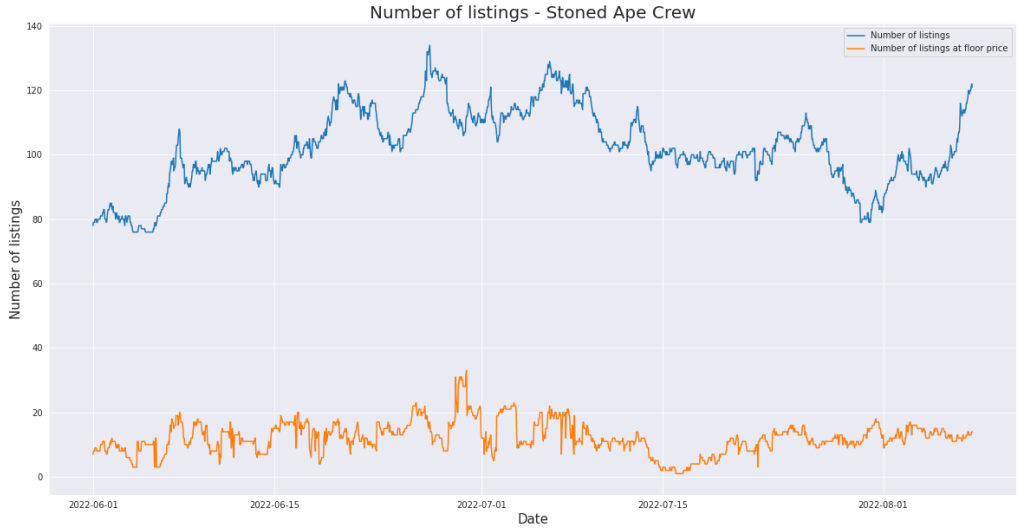
Where P_t is the price at a given time after FRAKT has listed its own NFTs, N_t represents the number of NFTs listed in the secondary market in each step, and R is determined by fitting the model to historical data.

In the following graph, we can observe the relation between the logarithmic variation in price and the number of listings.



For each step, we use as input the price changes determined by the brownian motion engine. We established the number of NFTs listed in the secondary market of MagicEden as the initial number of NFTs listed.

Sales modeling. For determining the probability of an NFT of being sold in each step, we assume that, for a given collection, every NFT listed close to floor price has an equal probability of being sold. We shall define listings close to floor price as those at most 20% above floor price.



In order to determine the probability of a given listed NFT being sold, we take into consideration the volume of sales of NFTs at floor price for a given collection in the past 14 days and we assume that the probability of being sold is equal for each of the NFT listed near floor price in each time step.

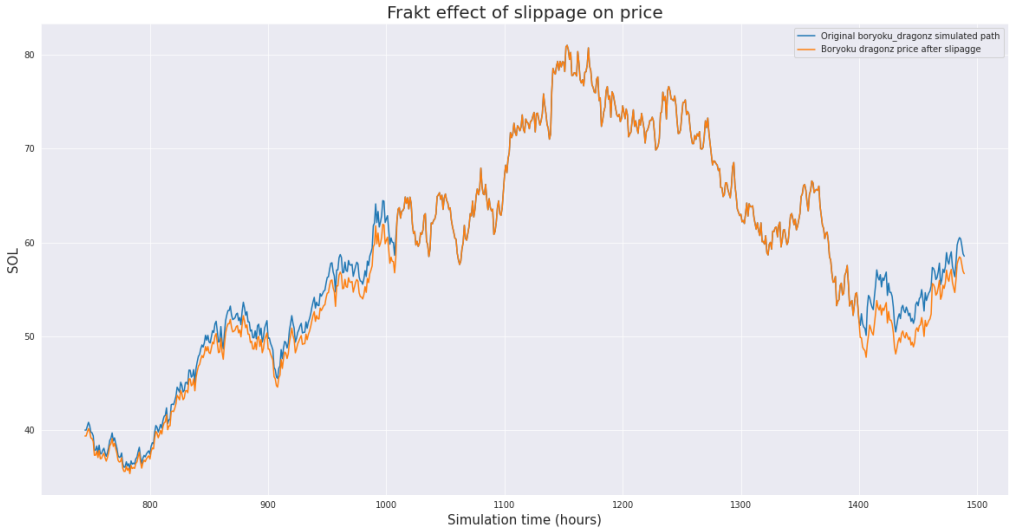
NFTs listed by FRAKT liquidators are considered to be re-listed at floor price constantly until they are sold. Therefore, they compete on equal conditions with the rest of the listings by the rest of the market.

FRAKT effect on market. The protocol can have an impact on the market prices if multiple loans default and result in NFT listings. We model this slippage in the same way as before:

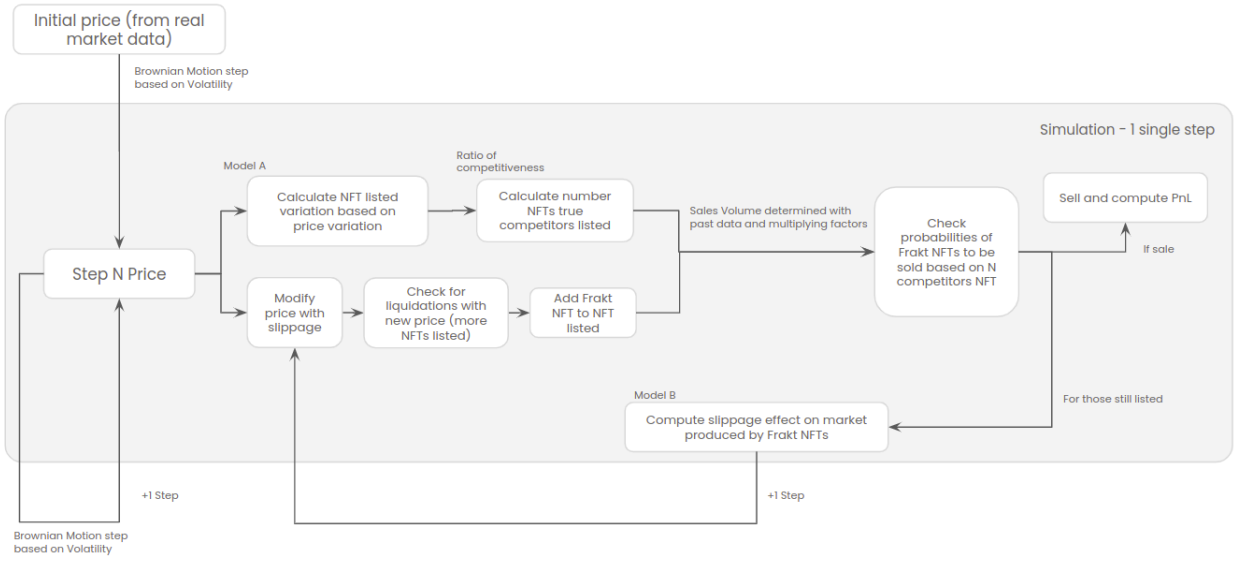
$$Ln(\frac{P_F}{P_o}) = \frac{1}{R} * Ln(\frac{N_F}{N_o})$$

Where P_F is the price at a given time after FRAKT has listed its own NFTs, P_o is the price previous to that, N_o represents the number of NFTs listed in secondary market before taking the protocol into account, and N_F would be the sum of N_o and the number of elements listed by the protocol liquidators. This model tracks potential liquidation cascades.

The price at which the liquidators sell their assets is considered to be the price after the impact of the additional listings on the price according to the slippage model above.



As mentioned before, the sales probability is equal for every NFT listed, so the amount of NFTs listed by the protocol liquidators will affect the probability for each of those NFTs of being sold.



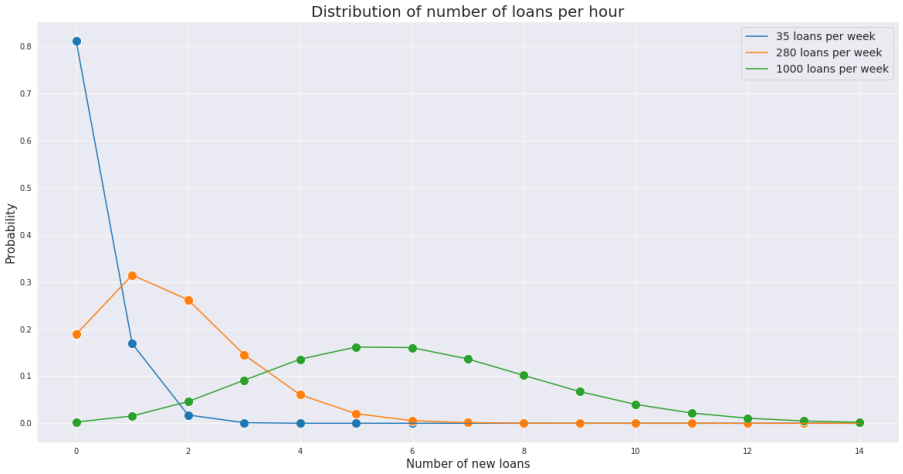
Agents modeling

Some assumptions are made to model the behavior of each of the agents.

Lenders. The amount of liquidity in a pool stays constant during the simulations. As a result no action is considered from the lenders.

Borrowers. Borrowers have a complex modeled behavior, with the following aspects:

- **Rate of new loans:** the rate at which borrowers request new loans from the various pools as the simulation advances in time. This has been modeled by fitting the rate of new loans for each pool into a Poisson distribution and sampling from it the number of new loan events (if any) at each step. If we want to emulate an increase in the number of loans in FRAKT, we increase this creation rate.



  In the case of the flips pool, where multiple different collections are allowed as collateral, the collateral for the new loan is sampled according to the current distribution for active loans.

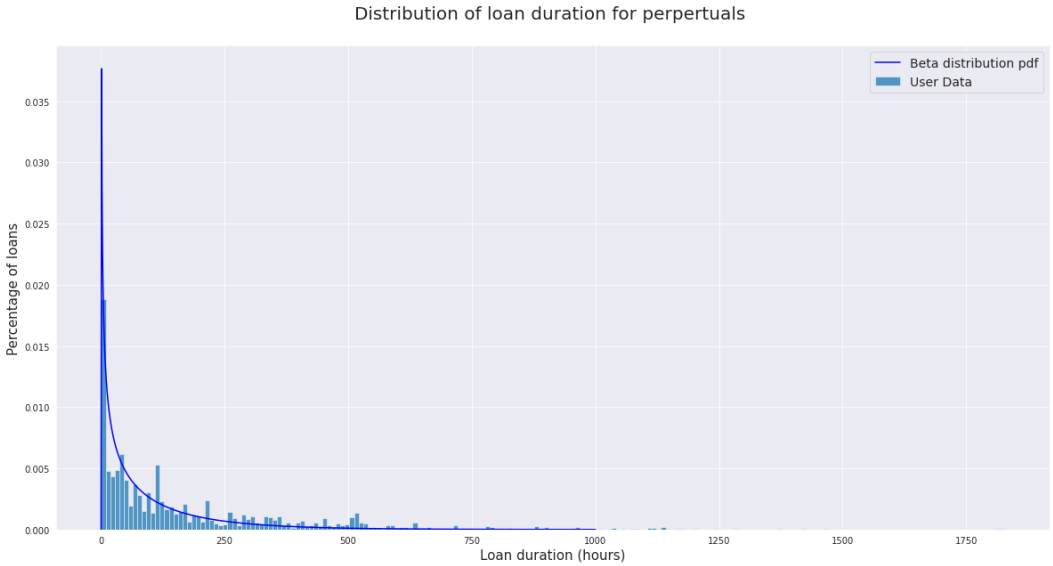
- **Loan size:** as a conservative approach, borrowers are considered to always take loans at the maximum loan-to-value (LTV) allowed for the corresponding collection and pool.

- **Loan duration:** the loan durations are sampled from a distribution fit to the latest data from the protocol.
  - For perpetuals, durations are not specified at the start of the process, but borrowers terminate the loan after a certain amount of time. From past data, these durations are considered to fit a beta distribution:

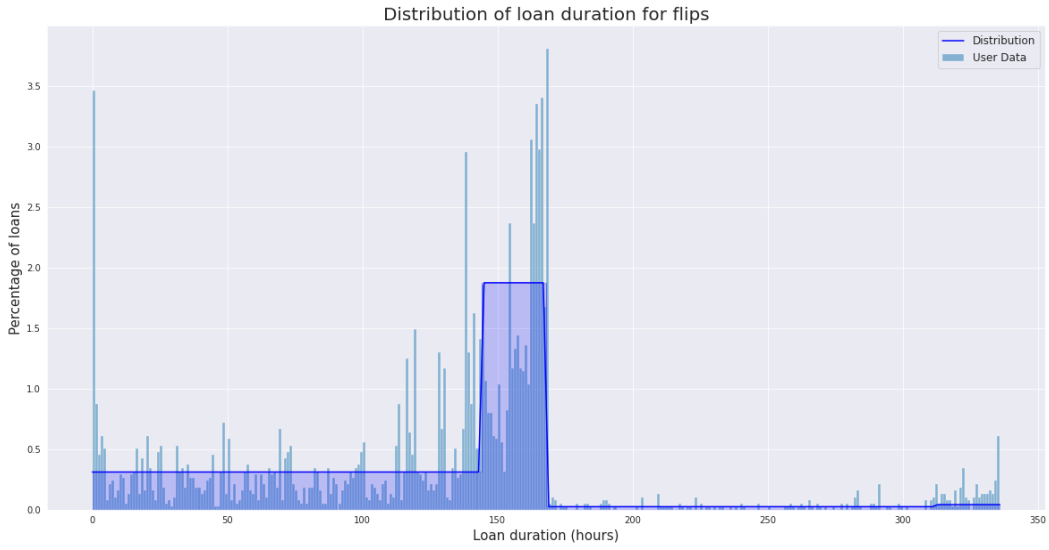
$$f(x, a, b) = \frac{\Gamma(a+b)x^{a-1}(1-x)^{b-1}}{\Gamma(a)\Gamma(b)}, \; 0 <= x <= 1, \; a > 0, \; b > 0$$

    where

$$\Gamma(z) = \int_0^\infty t^{z-1} e^{-t} dt, \; \Re(z) > 0$$



- For flips, maximum durations are fixed at the start at either 7 or 14 days. However, borrowers can choose to repay their loans before then.



From the historical data we can see that many users choose to repay their loans on the last day available, while others choose to repay uniformly on any of the previous days. As a result, durations for flips are modeled in with 4 uniform distributions, one from 1 to 6 days, another 6-7days, 7-13 days and 13 to 14 days.

- **Loan repayment:** borrowers are considered to repay their loans at risk of liquidation when this is economically favorable for them. Borrowers are considered to be long the

collateral asset and will seek it, but will consider whether it is cheaper to repay the loan or buy a different NFT from the same collection on the market. Therefore, they will repay when:

debt against nft < price of nft from the same collection in secondary market

Additionally, the data reflects that a certain percentage of the borrowers do not repay on time even with favorable conditions of their loans. This might be due to lack of sufficient funds, or due to forgetfulness. To emulate this behavior, we introduce a probability for any borrower not to repay their loan.

Liquidators. Liquidators act based on monetary incentives. At the end of each grace period, they will buy the liquidated collateral if

*debt against nft < price of nft in secondary market * (1 - marketplace fee - royalties)*

Marketplace fees and artist royalties might add up to over 10% of the sale value of the NFT, becoming an important factor to take into account for borrower and liquidator incentives

Once the liquidators have repaid the debt of a given loan and obtained an NFT at a discounted price with respect to the collection floor price, they are assumed to try to sell the NFT in the market in every simulation step according to the probability of sales described above. If the floor price of an NFT collection changes, liquidators adapt the price of their listings to match.

Oracles. For simplification, oracles are considered to work perfectly.

Results

In this section we present some examples of the result of the simulations for the different pools.

We stress the current market conditions to extract a sensitive analysis for each of the dimensions.

- Volatility is stressed in x1.5, x2, and x3 levels
- Number of loans in the protocol is stressed in x2, x5, x10 levels
- Total debt is stressed in x1.25, x1.5, x1.75
- Number of sales in the protocol is stressed in x0.75, x0.5, x0.25 levels

We present examples of the visualizations that can be find for each of the collections/pools in our dashboard [6]

Flips

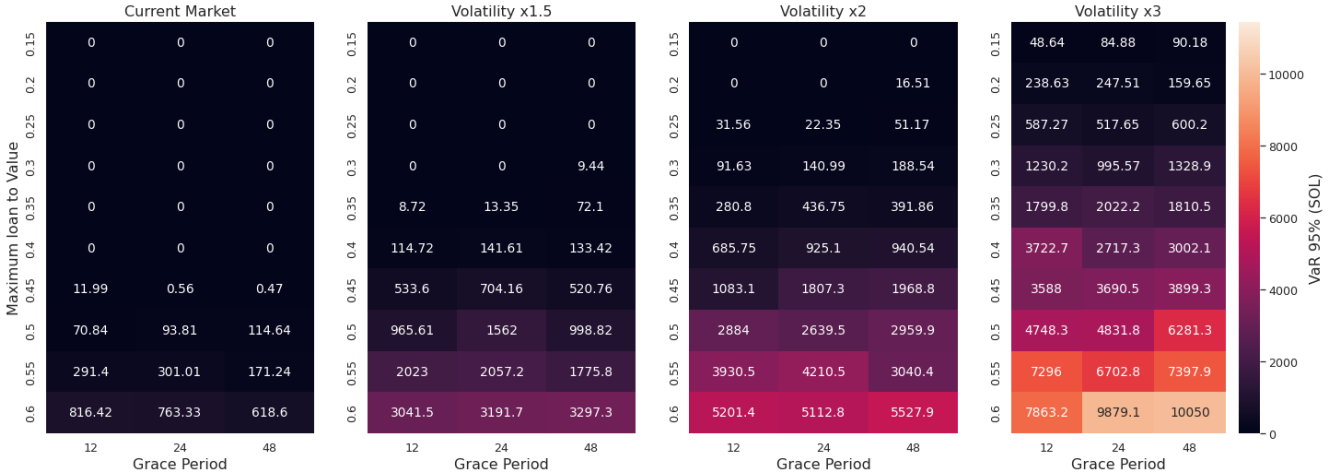
Due to the nature of the flip pools, which have multiple collections, it is extremely easy for the simulations to reach the failure condition. As a result, because of the poor information that the metric of failure condition gives, we will be just presenting the results in terms of VaR and LaR for the flips section.

Example of one collection

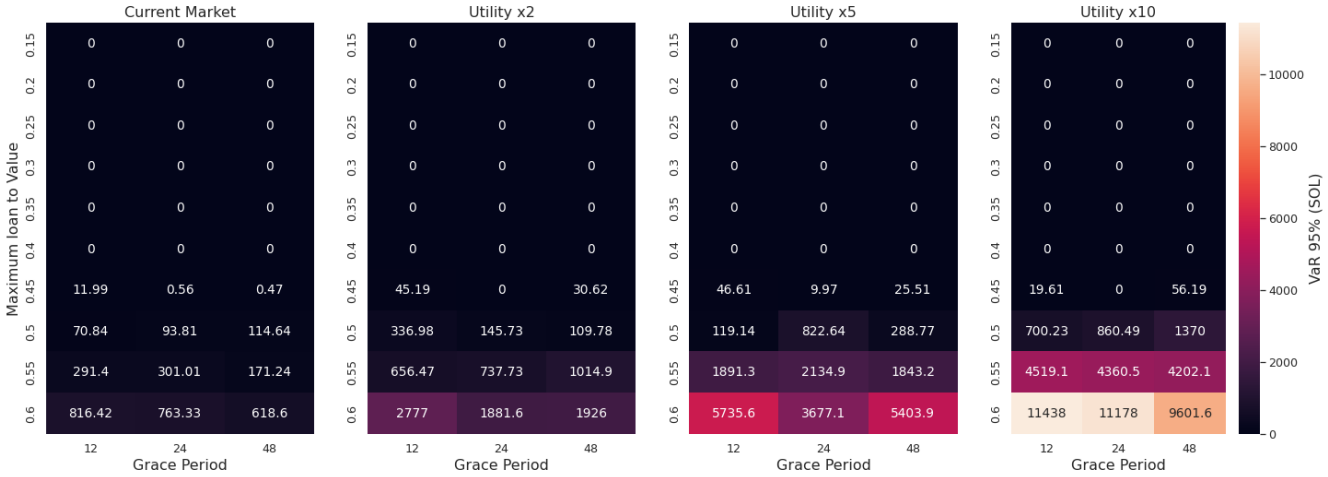
For each of the collections, we report the risk metrics with a heatmap.

ABC Abracadabra VaR

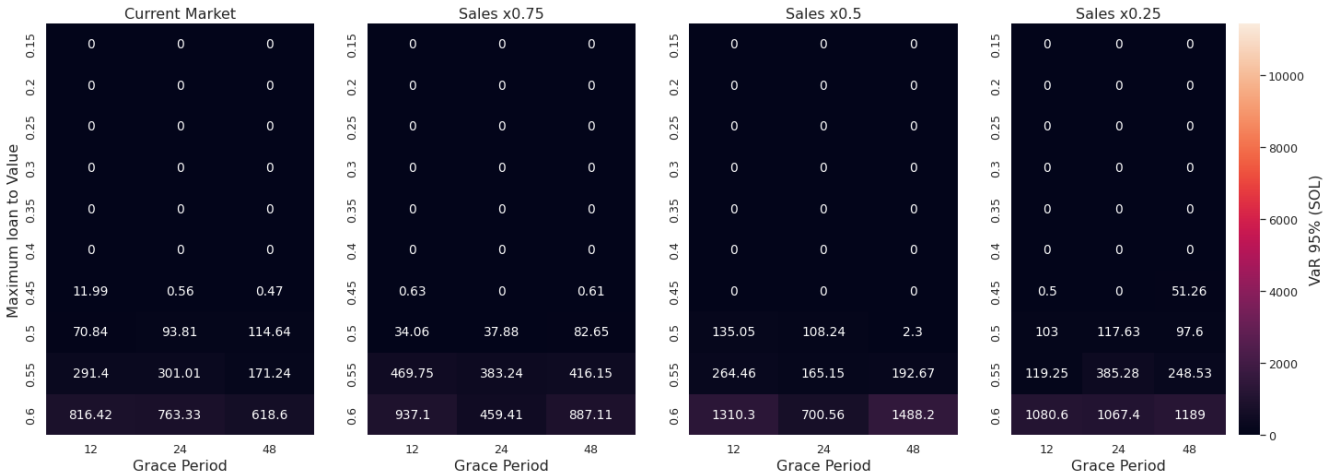
Volatility sensitivity analysis



Utilization sensitivity analysis



Sales sensitivity analysis



Which gives us the risk metrics for each of the sensitivity analysis. In the case of flips, **the main driver of the risk parameters is the maximum LTV allowed, rather than the grace period.** This is understandable, since a flip is a loan with a fixed duration, much longer than the grace period. As a result, its effect in terms of risk is essentially that of a slightly longer loan period.

FRAKT splits their collection into different tiers to assign them different LTVs for their flips. This collections categorization is made based on the project/collection robustness.

LTV 0.2 collections

	VaR	LaR
Degensweepers	0	0
FatCats Capital	0	0
Lotus Gang NFT	0	0
PenSol	0	0

	VaR	LaR
Shremp	0	0
SolDecoder	0	0
Udder Chaos	0	0

LTV 0.3 collections

	VaR	LaR
Baby Ape Social Club	0	0
Balloonsville	0	0
BlockAsset Legends	0	0
BVDcatz	0	0
Cets Milk Bottle	0	0
Critters Cult	0	0
Crypto Coral Tribe	0	0
Cyber Frogs	0	0
Dead Rejects	0	0
DSkullys	0.56	0
DuckPunkZ Universe	0	0
Dumbass Donkeys	0	0
Fearless Bulls Club	0.39	0
Flippin Rabbits	0	0
Frakt	4.81	0.29
Ghost Kid DAO	0	0
Heaven Land	0	0
Helions	0	0
Infected Mob	0	0
Kikiverse	0.5	0.01
Liberty Square	0	0

	VaR	LaR
Magic Ticket	0	0
Meerkat Millionaires Country Club	0	0
Monkey Baby Business	0	0
Netrunner	0	0
Photo Finish	0	0
Primates	0	0
Secret Skellies Society	0	0
Sentries	0	0
Smart Sea Society	0	0
Solswipe	0	0
Stylish Studs	0	0
T00bs	0	0
Taiyo Infants Incubators	0	0
TaiyoOil	0	0
The Bridged	0	0
The Remnants	0	0
TheOrcs	0	0
Trippin Ape Tribe	0	0
Utility Ape	0.3	0.01
Xin Dragons	0	0

LTV 0.4 collections

	VaR	LaR
ABC Abracadabra	0	1.13
Bohemia	0	0
Bubblegoose Ballers	0	0
Cega Super Sanics	0	0
ChillChat	0	0
Communi3	0	0
Critters Cult	0	0
Cyber Frogs	11.65	0.59
Degendojo NFT	0.65	0
Degenerate Trash Panda	4.09	0
DegenFatCats	0	1.13
FatCats Capital	0	0
Galactic Geckos	0	0
Grim Syndicate	0	0
JustApe	0	0

	VaR	LaR
Lifinity Flares	0	0
Nuked Apes	0	0
Oak Paradise	0	0
Pawnshop Gnomies	0	0.05
Pesky Penguins	0	0
Quantum Traders	0	0.01
Rakkudos	2.5	0.11
Smokeheads	2.41	0.18
The Catalina Whale Mixer	0	0
Thugbirdz	0	0
Tombstoned	0	0
Transdimensional Fox Federation	0	0
Turtles	0	0
Vandal City	0	0

LTV 0.5 collections

	VaR	LaR
Astrals	0	0
Aurory	0	0
Blocksmith Labs	0	0
Boryoku Dragonz	297.54	6.96
Cets on Creck	0	0
Degenerate Ape Academy	0	0
DeGods	0	0.06

	VaR	LaR
Famous Fox Federation	0	0
Okay Bears	16.05	0.82
Portals	0	0
Shadowy Super Coder	29.61	1.14
Solana Monkey Business	0	0
Stoned Ape Crew	0	0
Taiyo Robotics	0	0

Taking into account the LTVs that FRAKT is currently assigning to those different collection tiers, we conclude that most of the collections are operating within currently safe parameters, with some minor exceptions.

The main collection to look at is Boryoku Dragonz, which shows a specially high VaR. The collection has a low trading volume and low amount of assets listed, and the amount of NFTs backing a loan is higher than the total amount of weekly sales. The combination of these factors can lead to liquidation cascades, which pushes the prices to extremely low limits.

This collection represents the ~80% VaR of the flips pool and ~50% of LaR. By adjusting the risk parameters of the collection, the flips pool would be safe from any market risk under current conditions.

Perpetuals

In addition to the dimensions seen in the flips, we need to add another dimension for the perpetuals: the margin of safety.

Example of volatility

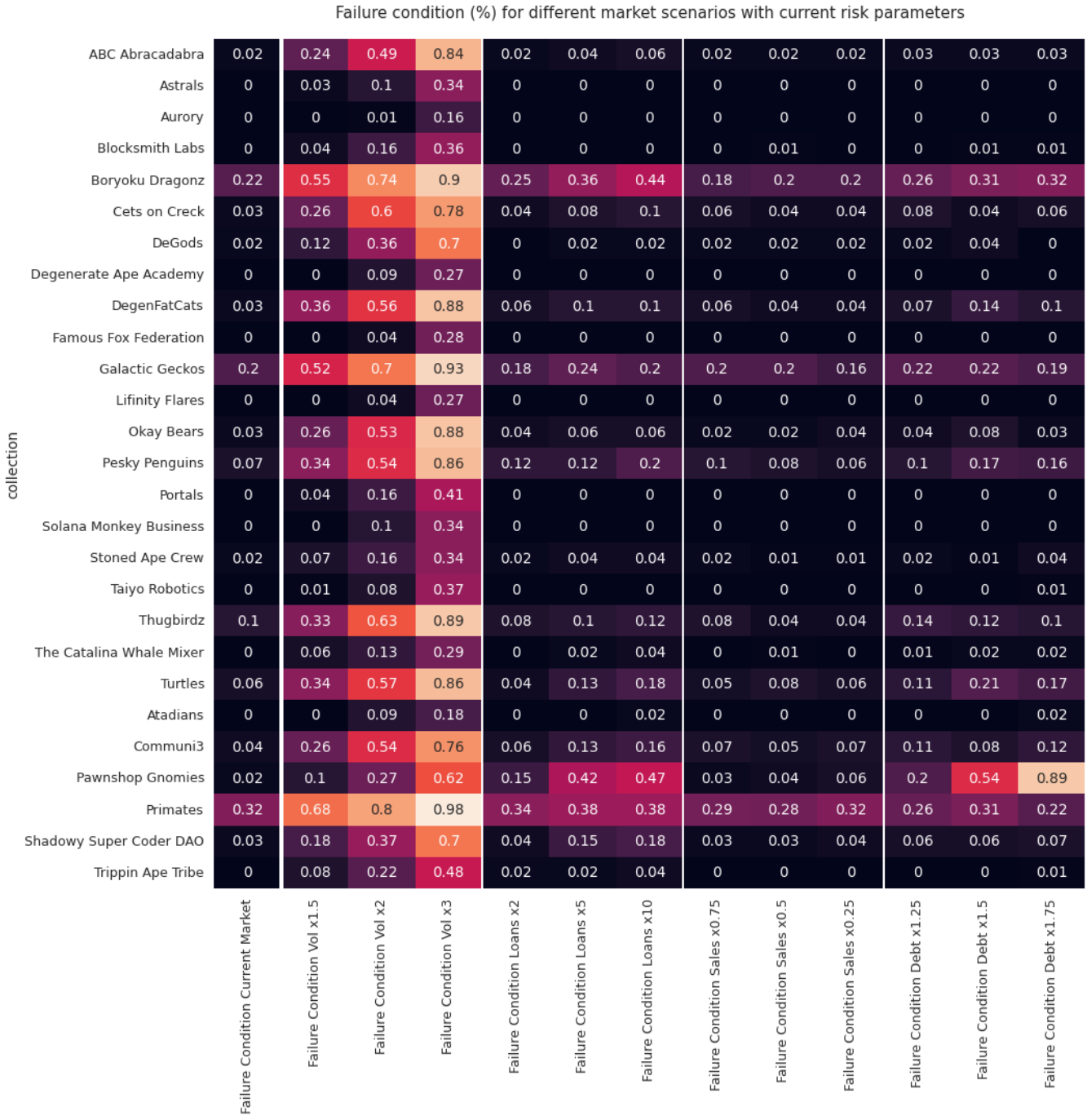

ABC Abracadabra VaR for different Volatilities
Current Market
48h Grace Period
24h Grace Period
12h Grace Period
Volatility x1.5
Volatility x2
Volatility x3
Maximum loan to Value
Margin of Safety
VaR 95% (SOL)

Due to how perpetuals work, we see a big difference in the effectiveness of the grace period. **By limiting the grace period, FRAKT would be able to reduce the risk considerably without limiting its capital efficiency.** However, the borrowers would suffer in terms of user experience, since they would have less time to repay a debt which is about to be liquidated.

Something similar happens with the margin of safety. Increasing this parameter triggers an earlier liquidation, worsening the borrower experience, but increasing liquidation incentives.

Current pools risks

Here we introduce the failure condition overview for every perpetual pool with their current protocol risk parameters and stressed market conditions.



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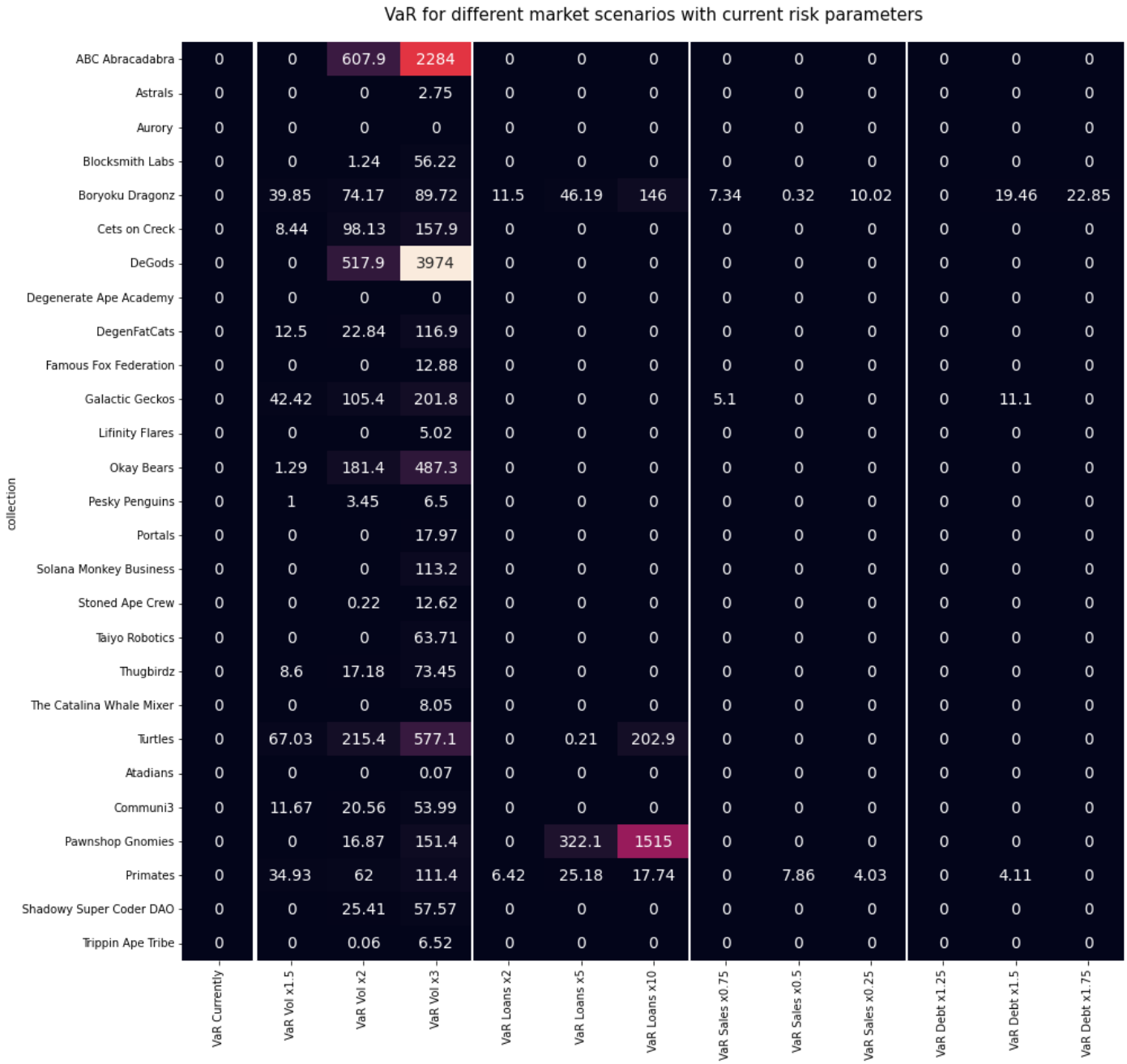
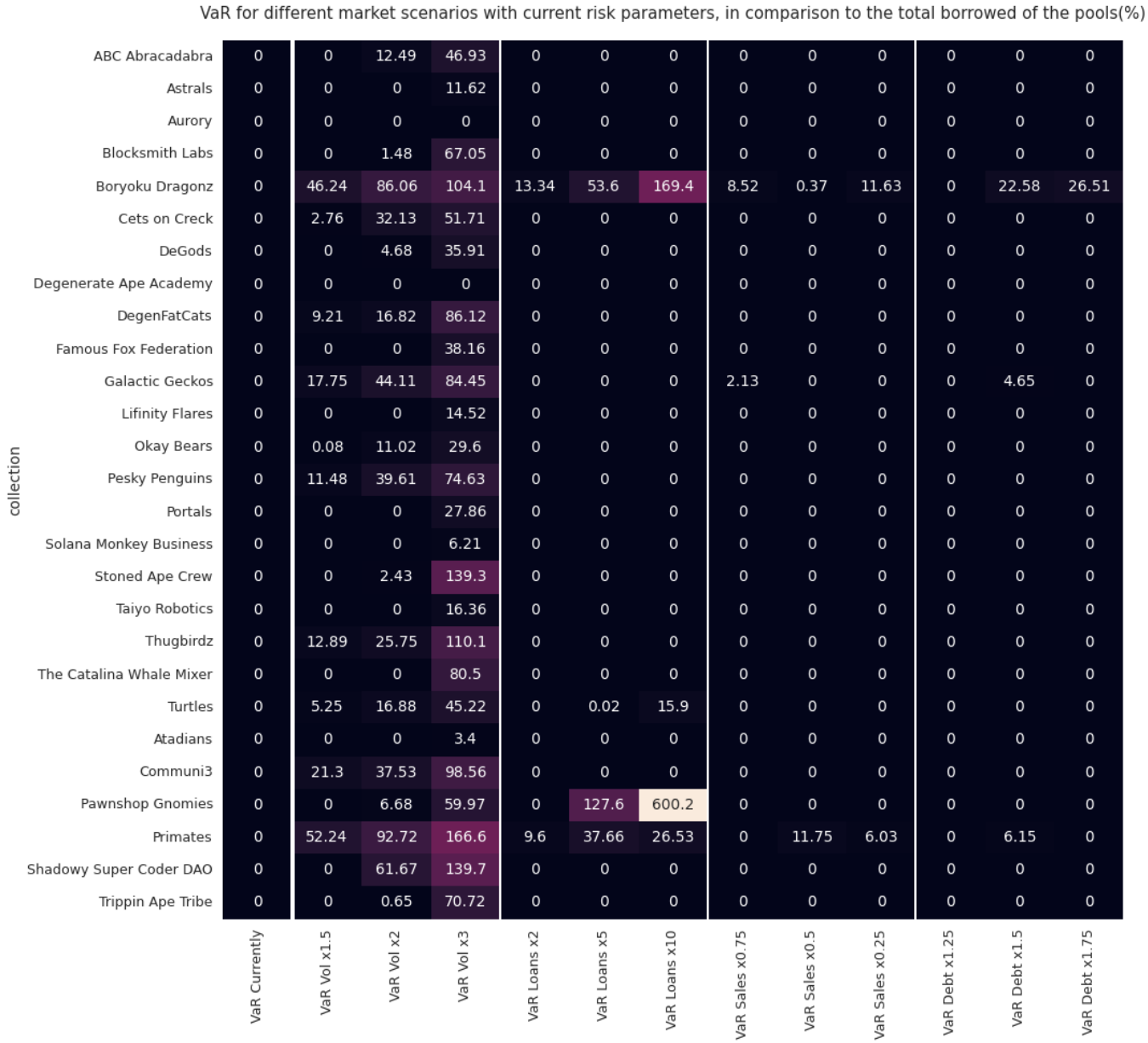
In terms of failure condition, we can appreciate how the following collections should be carefully monitored:

- Boryoku Dragonz
- Galactic Geckos
- Thugbirdz

- Justape
- Primates

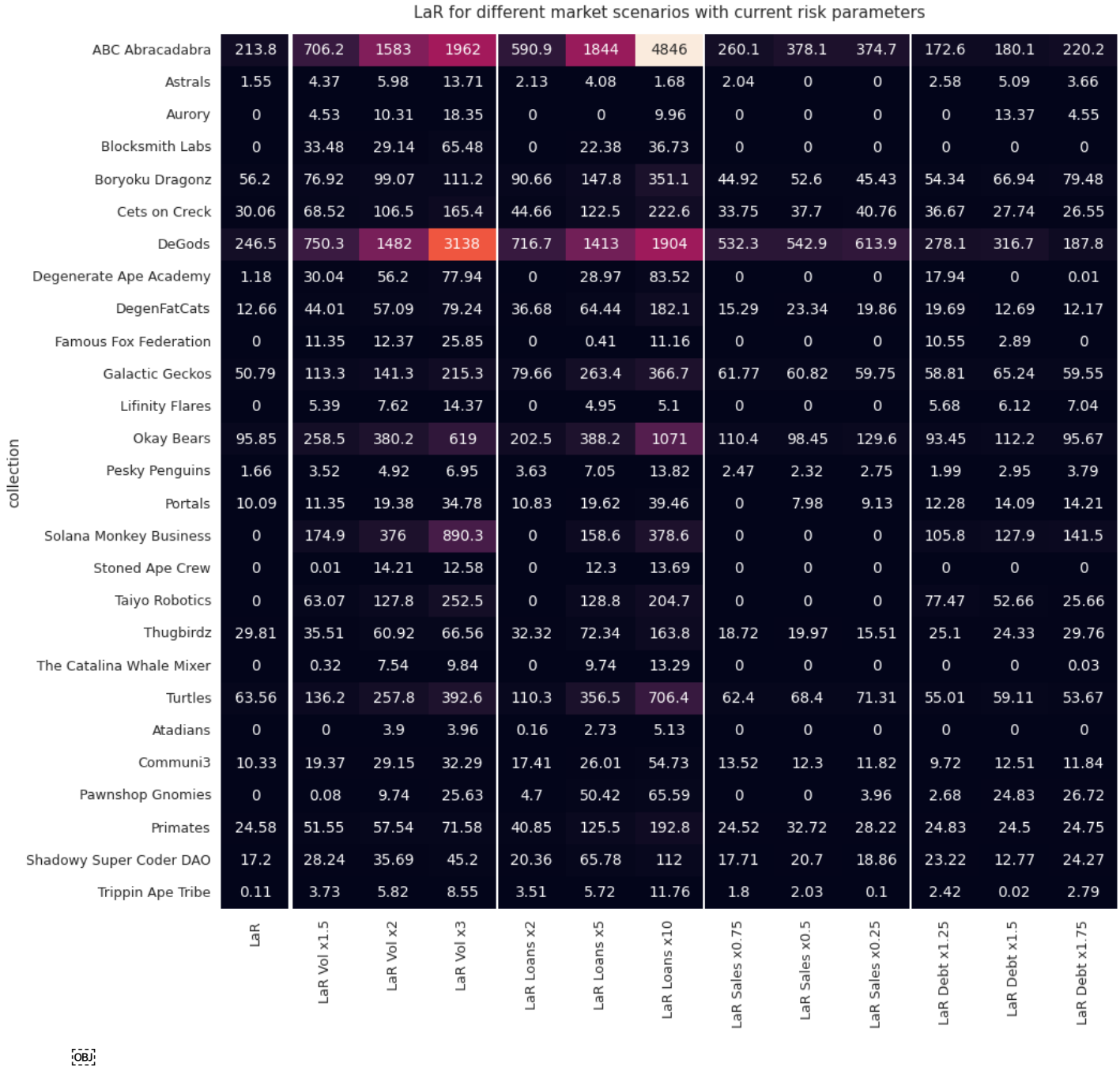
As we can see by looking at VaR and LaR (below), due to the current total value locked (TLV) of the pools, they are not a potential threat for FRAKT, but in case these pools grow, they could become one.





In terms of VaR, at the current market conditions the protocol has healthy risk parameters. The main reason why the VaR is zero for all of them even though there are some high failure conditions is because a liquidation might be not-incentivized at a specific point in time, but the market recovers after a while.

It is important to note that, both higher volatilities and amount of loans given for a specific collection are the main drivers for potential risks. The more mature the NFT-lending industry gets, the higher the amount of loans will be. As a result, this is one of the main parameters that FRAKT should pay attention to in order to avoid potential losses.


LaR for different market scenarios with current risk parameters
collection
ABC Abracadabra 213.8 706.2 1583 1962 590.9 1844 4846 260.1 378.1 374.7 172.6 180.1 220.2
Astrals 1.55 4.37 5.98 13.71 2.13 4.08 1.68 2.04 0 0 2.58 5.09 3.66
Aurory 0 4.53 10.31 18.35 0 0 9.96 0 0 0 0 13.37 4.55
Blocksmith Labs 0 33.48 29.14 65.48 0 22.38 36.73 0 0 0 0 0 0
Boryoku Dragonz 56.2 76.92 99.07 111.2 90.66 147.8 351.1 44.92 52.6 45.43 54.34 66.94 79.48
Cets on Creck 30.06 68.52 106.5 165.4 44.66 122.5 222.6 33.75 37.7 40.76 36.67 27.74 26.55
DeGods 246.5 750.3 1482 3138 716.7 1413 1904 532.3 542.9 613.9 278.1 316.7 187.8
Degenerate Ape Academy 1.18 30.04 56.2 77.94 0 28.97 83.52 0 0 0 17.94 0 0.01
DegenFatCats 12.66 44.01 57.09 79.24 36.68 64.44 182.1 15.29 23.34 19.86 19.69 12.69 12.17
Famous Fox Federation 0 11.35 12.37 25.85 0 0.41 11.16 0 0 0 10.55 2.89 0
Galactic Geckos 50.79 113.3 141.3 215.3 79.66 263.4 366.7 61.77 60.82 59.75 58.81 65.24 59.55
Lifinity Flares 0 5.39 7.62 14.37 0 4.95 5.1 0 0 0 5.68 6.12 7.04
Okay Bears 95.85 258.5 380.2 619 202.5 388.2 1071 110.4 98.45 129.6 93.45 112.2 95.67
Pesky Penguins 1.66 3.52 4.92 6.95 3.63 7.05 13.82 2.47 2.32 2.75 1.99 2.95 3.79
Portals 10.09 11.35 19.38 34.78 10.83 19.62 39.46 0 7.98 9.13 12.28 14.09 14.21
Solana Monkey Business 0 174.9 376 890.3 0 158.6 378.6 0 0 0 105.8 127.9 141.5
Stoned Ape Crew 0 0.01 14.21 12.58 0 12.3 13.69 0 0 0 0 0 0
Taiyo Robotics 0 63.07 127.8 252.5 0 128.8 204.7 0 0 0 77.47 52.66 25.66
Thugbirdz 29.81 35.51 60.92 66.56 32.32 72.34 163.8 18.72 19.97 15.51 25.1 24.33 29.76
The Catalina Whale Mixer 0 0.32 7.54 9.84 0 9.74 13.29 0 0 0 0 0 0.03
Turtles 63.56 136.2 257.8 392.6 110.3 356.5 706.4 62.4 68.4 71.31 55.01 59.11 53.67
Atadians 0 0 3.9 3.96 0.16 2.73 5.13 0 0 0 0 0 0
Communi3 10.33 19.37 29.15 32.29 17.41 26.01 54.73 13.52 12.3 11.82 9.72 12.51 11.84
Pawnshop Gnomies 0 0.08 9.74 25.63 4.7 50.42 65.59 0 0 3.96 2.68 24.83 26.72
Primates 24.58 51.55 57.54 71.58 40.85 125.5 192.8 24.52 32.72 28.22 24.83 24.5 24.75
Shadowy Super Coder DAO 17.2 28.24 35.69 45.2 20.36 65.78 112 17.71 20.7 18.86 23.22 12.77 24.27
Trippin Ape Tribe 0.11 3.73 5.82 8.55 3.51 5.72 11.76 1.8 2.03 0.1 2.42 0.02 2.79
LaR
LaR Vol x1.5
LaR Vol x2
LaR Vol x3
LaR Loans x2
LaR Loans x5
LaR Loans x10
LaR Sales x0.75
LaR Sales x0.5
LaR Sales x0.25
LaR Debt x1.25
LaR Debt x1.5
LaR Debt x1.75
OBJ

The same applies for LaR, which is already noticeable for some of the collections. If we get a closer look at ABC and Degods, one of the most popular collections for NFT lending, by increasing the number of loans by x5, we find already a LaR which is ~38% and ~13% respectively of the total amount lent.

This increase in the amount of loans might seem ridiculously high. However, it is not hard to reach, considering there are multiple pools in FRAKT and multiple NFT-lending markets in the industry that count towards this value.

Conclusions

This report has presented the first agent-based risk modeling for the P2Pool NFT-lending industry, and shown simulation results in order to assess the FRAKT protocol health.

Taking into account the high volatility of the NFT industry, and despite the high yields it offers, FRAKT is currently an overall healthy protocol.

Minor changes are required to reduce its risks regarding certain specific collections:

1. Cenit Finance suggests actively reducing the exposure from Boryoku Dragonz for the flips pool
2. In addition to that, the perpetual lending pools for
    - Boryoku Dragonz
    - Galactic Geckos
    - Thugbirdz
    - Justape
    - Primates

    should be carefully monitored, although currently, due to their size, do not present a systemic risk for FRAKT.

For the pool of flips, the simulations show how the most effective option to reduce the protocol risks is the max LTV. However, for perpetuals, Frakt can make use of both the Margin of Safety and the Grace Period to significantly reduce the risks without affecting the capital efficiency of the protocol.

Overall, the main market drivers for potential losses are volatility and the amount of debt (number of total loans) of the market. Changes in market volatility and lending ecosystem should lead to a readjustment of the risk parameters to avoid potential losses. Specific efforts should be made to avoid reaching high amounts of loans backing just one collection.

Final note

The NFT-lending industry is maturing at high speed, resulting in several players that accept loans for mostly the same collections as collateral. While the amount of debt that FRAKT is introducing in the industry at the moment is low enough not to threaten its stability, it is extremely important to monitor the debt of every player in the industry to prevent a potential crash due to liquidations cascades.

At Cenit, we will apply this methodology for constantly monitoring the health of FRAKT for the future changing market to ensure that FRAKT is a healthy protocol and that the industry grows at sustainable rates.

This monitoring will be publicly available in the Frakt Dashboard [6]. At the same time, we will be incorporating the latest industry learnings and status to improve our models.

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