

Liquidation

Debt categories

On Open, all loans are characterised under one of the three debt categories - DC_1 , DC2, DC3. This categorisation is based on the CDR range of the loan at the time of borrowing.

Debt category 1(DC1)	$CDR \geq 1$	Collateral > Debt
Debt category 2(DC2)	$0.5 \leq CDR < 1$	Loan is higher than the collateral, but less than 200% of the collateral value(in usd).
Debt category 3(DC3)	$0.333 \leq CDR < 0.5$	Loan exceeds collateral by 200% in usd value, but is less than 300% of the collateral value(in usd).

Liquidation price

The price at which the collateral is liquidated. The category specific liquidation price is determined by the calculations mentioned in the below table. Any outstanding loan upon reaching its liquidation price gets liquidated by the liquidators.

Loan category	CDR Range	Liquidation price formula
DC_1	$CDR \geq 1$	$L_p = (1.06) \times L_{a.v}$
DC_2	$0.5 \leq CDR < 1$	$L_p = (1.05) \times L_{a.v}$
DC_3	$0.333 \leq CDR < 0.5$	$L_p = (1.04) \times L_{a.v}$

L_p = Liquidation price(denominated in the actual loan market).

$L_{a.v}$ = Actual loan value.

Liquidation price formula is calculated based on a loan's debt category. When the current value of collateral+loan equates to that of the liquidation price formula, the loan is regarded as distressed. Distressed loans enter liquidation, to be liquidated by the liquidators. Inversely, a loan remains secure from liquidation as long as it fulfils the below condition.

$$C_{c.v} + L_{c.v} > (1 + \alpha) \times L_{a.v}$$

- $C_{c.v}$ = Current collateral amount
- $L_{c.v}$ = Current loan amount. Can be in primary/secondary market
- $L_{a.v}$ = Actual loan value.
- α = Liquidation discount. 6% for DC1, 5% for DC2, 4% for DC3.

Both the LHS & RHS are denominated in the actual loan market(hereafter, ALMD).

Liquidation call

When a collateral nears its liquidation price, a notification is sent to the borrower through in-app. Additionally, the borrower can enable email & telegram notifications for ease. A liquidation call is triggered at a price determined by the below condition.

$$L_c = (1.03) \times L_p$$

- L_c = Liquidation call price(ALMD¹)
- L_p = Liquidation price(ALMD)

The 0.03, or 3% multiplier to the L_p serves as a price-cushion between the borrower's ability to react & the loan's probability of entering liquidation. L_c are protocol's way of reminding a borrower to provide additional collateral to maintain the loan's positive health factor, or close through repayment. Inaction implies the loan could turn into a NPA², eventually to be liquidated by the liquidators. Loans closed through repayment, at this stage will attract a 1% additional protocol fees. This fee is set by the comptroller, and is subject to change based on the community governance.

Liquidator

On Open, any stakeholder can become a liquidator by staking HASH³ tokens as a 3 month mcp⁴. The minimum deposit amount will be determined & communicated to all the stakeholders during the

¹ Actual loan market denomination

² Non performing asset

³ Hashstack's governance token

⁴ Minimum commitment period

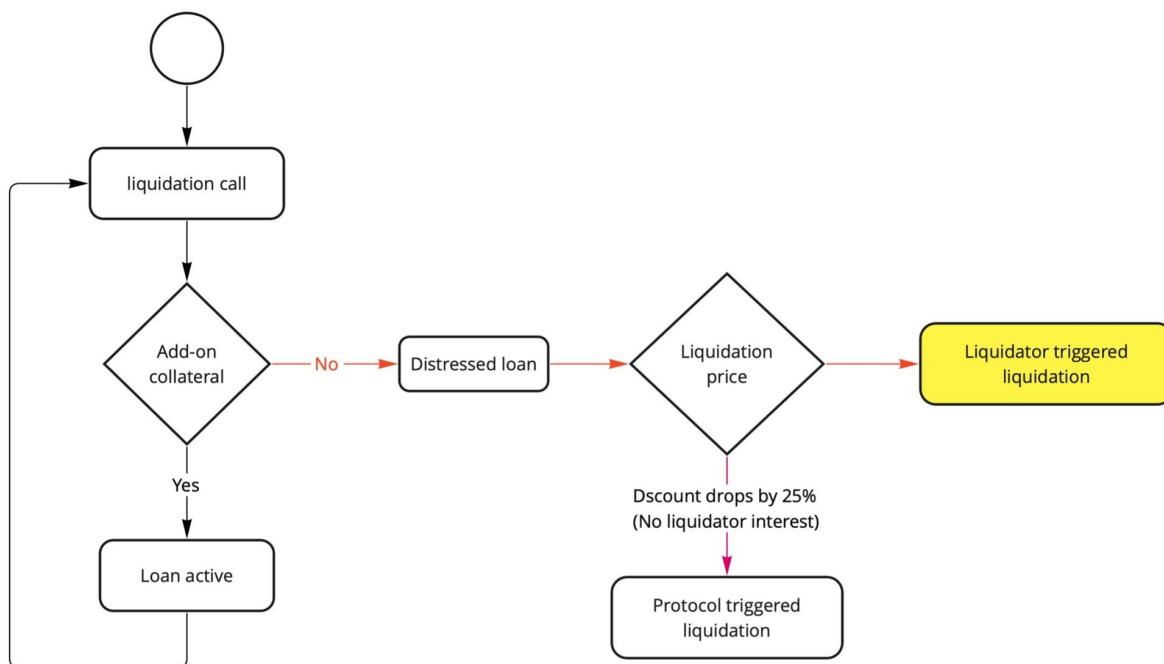
Mainnet(beta). Higher debt category implies increased risks to the protocol & its lenders in the events of default. To mitigate this, the effective discount applied also increases as the debt category ascends from 1 to 3. The increased discounts provide better incentives to the liquidators to prioritise the liquidations of over-leveraged loans, while subtly nudging the borrowers to be mindful of their risk exposure.

Dual liquidation

To mitigate complete reliance on the liquidators to liquidate npa, the open protocol suggests a dual-liquidation strategy. This implies, the protocol continues to monitor a loan even after it is pushed for liquidation.

When a distressed loan is not liquidated as the discount offered drops by 25%, the protocol assumes the role of a liquidator and liquidator it off chain through centralised means.

Dual liquidation approach secures the protocol from inadvertent risks during market-crash, network congestion, or liquidator disinterest scenarios; ensuring a distressed loan is timely liquidated.



Debt category	Liquidation price formula for Liquidators	Liquidation price formula for the protocol
DC_1	$L_p = (1.06) \times L_{a.v}$	$L_p = (1.045) \times L_{a.v}$
DC_2	$L_p = (1.05) \times L_{a.v}$	$L_p = (1.0375) \times L_{a.v}$

DC_3	$L_p = (1.04) \times L_{a.v}$	$L_p = (1.03) \times L_{a.v}$
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Discount sharing

For liquidator processed liquidations, the liquidation discount is shared between the protocol & the liquidator in the ratio of 3:7, with the liquidator earning a lion share of 70% . There is no discount sharing on the protocol processed liquidations.