How Much Should a Lender Advance Against Crypto?

Research note · Gaurav Gupta · 22 October 2026 · Walk-forward test of four collateral haircut rules on 17 coins, Coin Metrics daily reference prices, January 2018 to May 2026

$301M
Uncovered loss per $1bn across six crashes, 1-year VaR haircut (passes its backtest)

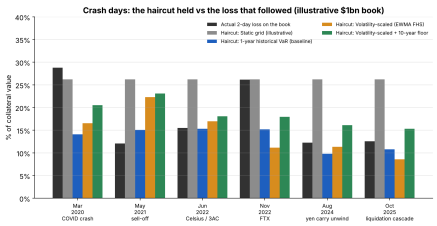
$165M
Same crashes, volatility-scaled haircut + 10-year floor (45% less)

$55M
Lending given up per $1bn for the floor; break-even at 1 client failure in ~7 crashes

$289M
5-day margin call a pure volatility-scaled rule would have made in March 2020

Rule	Avg haircut (coins)	Breach rate	Avg lent / $1bn	Crash-date loss (6 events)	Worst loss	Peak 5-day call
Static grid (illustrative)	37.6%	0.04%	$738M	$25.8M (1 of 6)	$136.9M	$0
1-year historical VaR (baseline)	16.4%	1.18%	$860M	$300.9M (5 of 6)	$258.3M	$18.0M
Volatility-scaled (EWMA FHS)	16.5%	1.15%	$852M	$321.7M (4 of 6)	$230.1M	$288.5M
Volatility-scaled + 10-year floor	21.8%	0.30%	$805M	$164.7M (2 of 6)	$193.6M	$241.8M

99% confidence, 2-day close-out. 44,497 coin-days; Kupiec p: 0.00 / 0.07 / 0.09 / 0.00 on 22,255 non-overlapping windows. Book: illustrative $1bn, 50% BTC, 25% ETH, 25% other lendable coins, cross-margined. Crash dates fixed in advance: 11 Mar 2020, 18 May 2021, 12 Jun 2022, 7 Nov 2022, 3 Aug 2024, 9 Oct 2025. Worst window for every rule: 10-12 Mar 2020 (book -39.9%).



Crash dates: two-day book loss (black) vs each rule's haircut that morning.

SOURCES

- Coin Metrics Community Data, daily PriceUSD, CC BY-NC 4.0, github.com/coinmetrics/data @ f1a36af (sha256 per file in repo manifest), downloaded 22 Oct 2026
- 17 coins incl. MATIC until its series ends (no survivorship); USDT, USDC tested separately
- Methods: RiskMetrics (1996); Barone-Adesi, Giannopoulos & Vosper (1999); Kupiec (1995); Christoffersen (1998); EU Reg. 153/2013 Art. 28

METHOD

- Haircut on day t from prices up to t only (unit test rewrites the future, haircuts unchanged)
- Baseline: 1st pct of 2-day returns, trailing year
- FHS: 3y of 2-day returns / EWMA vol (0.94), x today's vol
- Floor: 1st pct of 2-day returns over up to 10 years
- Scored on loss from t to t+2; breach if loss > haircut

KEY CALCULATIONS

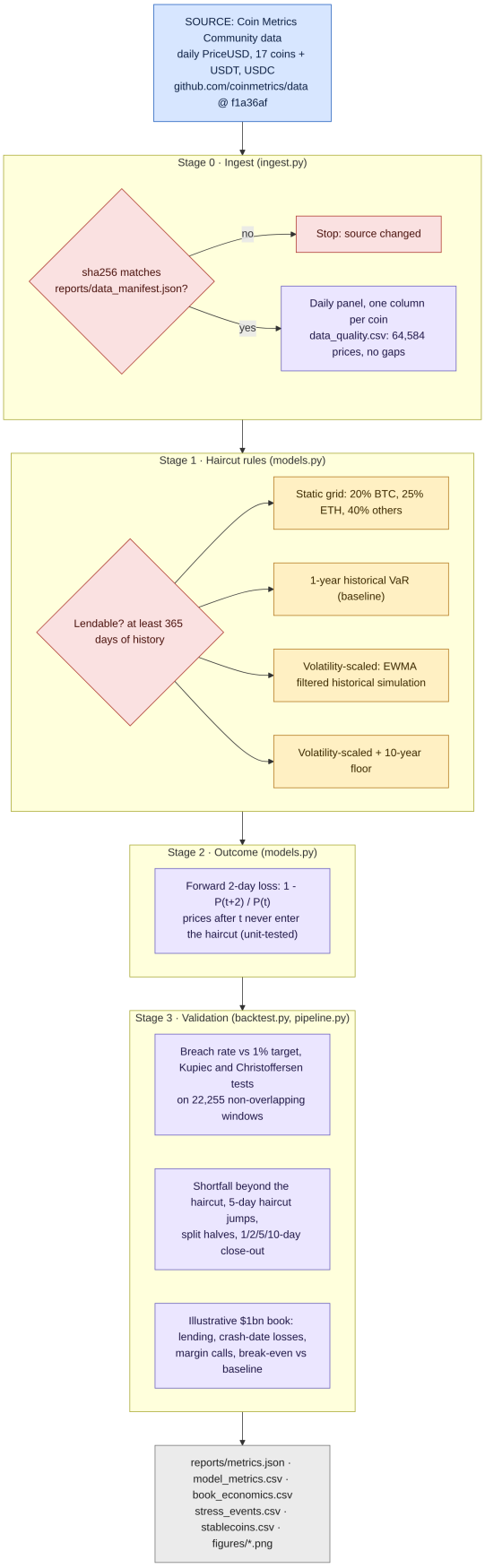
- Uncovered loss = max(loss - haircut, 0) x collateral
- Margin call = 5-day rise in book haircut x $1bn
- Spread revenue = 4% x amount lent (illustrative)
- Break-even = spread given up / crash loss avoided: floor $18.4M / $136.2M = 13.5%; grid $41.2M / $275.1M = 15.0%
- Split halves: baseline breach 1.29% / 1.11%; floor 0.38% / 0.25%

RECOMMENDATIONS

- Replace the 1-year VaR with a volatility-scaled haircut and a 10-year floor: about $55M less lending per $1bn, crash loss $301M to $165M.
- Judge haircut rules on loss in named crash scenarios, not only on breach frequency; a 1% breach rate is necessary, not sufficient.
- Set a book-level limit on uncovered loss at a 40% two-day move: no rule covered 10-12 March 2020.
- Phase margin increases over three days unless the stress limit is breached; keep tier minimums for thin coins and a non-zero stablecoin haircut (USDC: 0.08% haircut, 2.9% loss, Mar 2023).
- Monthly review with the 1-year VaR and static grid as challengers; escalate crash-scenario loss or call sizes beyond limits.

Independent research on public data; not deployed; not investment or lending advice. Static grid, lending spread and book composition are illustrative. Daily reference prices exclude intraday lows and liquidation slippage. Code: github.com/guptagaurav-info/crypto-collateral-haircuts · Article: guptagaurav.info/articles/how-much-to-lend-against-crypto

Pipeline: data, haircut rules, outcome, validation



One daily haircut decision and its controls

