

Collateral Risk Assessment - Coinbase's wrapped DOGE [cbDOGE]

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Introduction

Anthias Labs supports onboarding cbDOGE as collateral in Moonwell’s Core markets on Base. Below we share the results of our analysis, and subsequent parameter recommendations.

About cbDOGE

Coinbase Wrapped Dogecoin (cbDOGE) is an ERC-20 token issued by Coinbase, representing Dogecoin (DOGE) on blockchains like Base and Ethereum. Backed 1:1 by DOGE held in Coinbase’s custody, cbDOGE enables Dogecoin holders to participate in DeFi ecosystems, bridging the popular memecoin to new use cases.

Dogecoin (DOGE) is the original meme coin, and second-biggest proof-of-work cryptocurrency by market cap behind Bitcoin. It was launched in 2013 as a joke, poking fun at the large number of crypto project entering the market following the rapid ascent of Bitcoin, and playing off of the popular “doge” internet meme. Dogecoin is a fork of Litecoin, which itself was forked from Bitcoin.

Initially obscure, Dogecoin gained prominence when Elon Musk endorsed it in 2019, calling it his “favorite cryptocurrency” on Twitter. With subsequent tweets, including a pivotal 2021 post, he sparked a meteoric rise that propelled Dogecoin into the mainstream. Today Dogecoin sits as the 8th largest cryptocurrency by market cap.

Minting and Redeeming

- **Minting:** A user initiates a withdrawal of DOGE held in their Coinbase account to an address/wallet on Base. An equivalent amount of cbDOGE is minted and sent to the specified address, with the original DOGE being locked in a secure reserve.
- **Redeeming:** A user sends cbDOGE to their Coinbase account, upon deposit the wrapped tokens are burned and the corresponding DOGE is moved from the reserve and credited to the users account.

This process guarantees a strict 1:1 peg with DOGE, ensuring that every cbDOGE token is fully backed by an equivalent reserve of DOGE. Additionally, this mechanism essentially enhances liquidity for cbDOGE on Base by providing access to external liquidity sources, with Coinbase serving as a bridge. For Moonwell, this means parameters like supply caps, borrow caps, and collateral factor can factor in this ability to redeem directly as there is decreased risk of bad debt due to unprofitable liquidations. Liquidators with a Coinbase account can easily access external liquidity sources, mitigating the impact of slippage on DEXs, and preserving profitability. By contrast, non-wrapped assets face stricter limitations, as they are solely reliant on DEX liquidity.

Smart Contract Risk

The cbDOGE token contract inherits from the Centre `FiatTokenV2.1` contract, a robust framework tailored for tokenized assets backed by off-chain reserves. The smart contracts

for cbDOGE are identical to those used for Coinbase Wrapped Bitcoin (cbBTC) and Coinbase Wrapped Staked ETH (cbETH), which have been rigorously audited and operational since cbETH's launch in August 2022.

Contract Details

The cbDOGE token contract is deployed at `0xcbD06E5A2B0C65597161de254AA074E489dEb510` on the Base network. The contract inherits from `FiatTokenV2.1` from the Centre Tokens repository. This contract extends the ERC-20 standard with features like minting, burning, blacklisting, and pausing.

Key Roles and Functionalities:

- **Admin:** Manages contract upgrades via the proxy pattern, enabling updates without altering the token address.
- **Owner:** Configures roles (e.g., Minter, Blacklister) and sets parameters like minting limits.
- **MasterMinter:** Authorizes minters and defines their minting allowances.
- **Minter:** Executes minting and burning of cbDOGE tokens, aligning with DOGE deposits and withdrawals.
- **Blacklister:** Restricts addresses from transacting, enhancing compliance and security.
- **Pauser:** Halts all token operations (transfers, minting, burning) in emergencies.

Key Functions:

- `mint(address _to, uint256 _amount)`: Issues cbDOGE tokens when DOGE is deposited, restricted by `onlyMinters`, `notBlacklisted`, and `whenNotPaused` modifiers.
- `burn(address _from, uint256 _amount)`: Removes cbDOGE tokens when redeemed for DOGE, with similar restrictions.
- `blacklist(address _account)`: Prevents specified addresses from interacting with cbDOGE.
- `pause()` and `unpause()`: Temporarily disables or re-enables contract operations (e.g.
- cbDOGE uses a proxy contract (`FiatTokenProxy`) to delegate calls to the `FiatTokenV2.1` implementation, enabling upgradability. This ensures flexibility for future enhancements but requires careful management of the Admin role.
- A separate `MinterForwarder` contract handles rate-limited minting to control cbDOGE supply growth.

Risk Assessment

The smart contract risk for cbDOGE is low due to:

- The `FiatTokenV2.1` framework has been battle-tested for over three years with cbETH and cbBTC, with no critical failures.

- OpenZeppelin’s audit ensures high code quality and security, with no material changes to the contract code for cbDOGE deployment.

Residual Risks:

- The proxy pattern allows the Admin to upgrade the implementation, which could introduce bugs if not thoroughly audited. Coinbase mitigates this with multi-party approval for upgrades.

OpenZeppelin Audit: <https://blog.openzeppelin.com/coinbase-liquid-staking-token-audit>

Coinbase wrapped-tokens GitHub Repo: <https://github.com/coinbase/wrapped-tokens-os/tree/main>

Counterparty Risk

The cbDOGE ecosystem is centralized due to Coinbase’s control over smart contract operations and the underlying DOGE reserves. As the sole custodian and operator, Coinbase’s reliability, security practices, and regulatory compliance are critical to cbDOGE’s integrity.

Key Risks

- Users rely on Coinbase to securely hold DOGE reserves. A failure, compromise, or insolvency at Coinbase could jeopardize cbDOGE’s backing, preventing redemption of DOGE.
- Coinbase’s control over all smart contract roles introduces a single point of failure. For example, a compromised Admin or Owner account could lead to unauthorized upgrades or minting.
- The Blacklist role allows Coinbase to restrict addresses, potentially limiting user access to funds for compliance or security reasons. This could affect users in jurisdictions with regulatory restrictions.
- As a publicly traded company operating under strict regulatory frameworks (e.g., AML, KYC), Coinbase may face legal or regulatory actions that could disrupt cbDOGE operations or reserve management.

Mitigations

- Coinbase’s custody solution uses hot and cold wallets, with private keys for cold storage held in secure facilities in the United States and Europe. Keys are not stored in plaintext and require multi-party cryptographic consensus for access, preventing single-point failures. Coinbase avoids sub-custodians, maintaining direct control over DOGE reserves.
- Coinbase provides transparency through on-chain data, allowing users to verify the 1:1 backing.
- As a publicly traded company, Coinbase is subject to shareholder and regulatory scrutiny, reducing the likelihood of malicious intent or mismanagement.

Proof of Reserves

Coinbase provides verifiable on-chain proof of reserves. Proof of reserves for cbDOGE can be viewed here: <https://www.coinbase.com/cbdoge/proof-of-reserves>

Risk Parameter Recommendations

Parameter	Value
Collateral Factor	65%
Supply Cap	10M cbDOGE
Borrow Cap	4.5M cbDOGE
Protocol Seize Share	30%

IR Parameter Recommendations

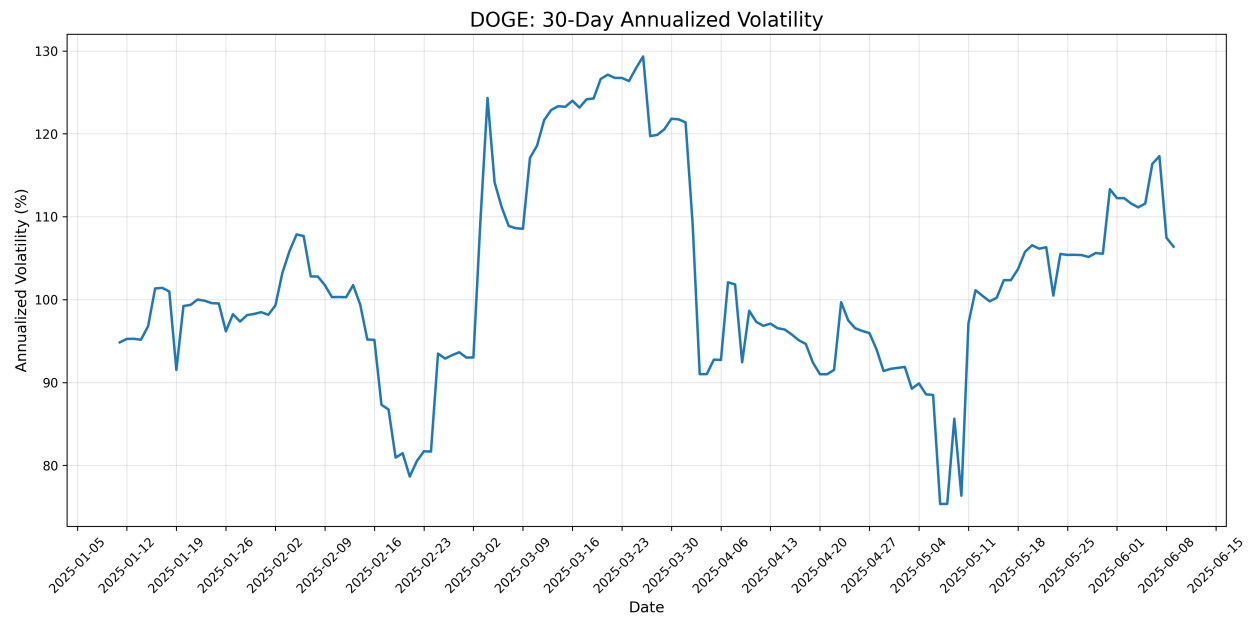
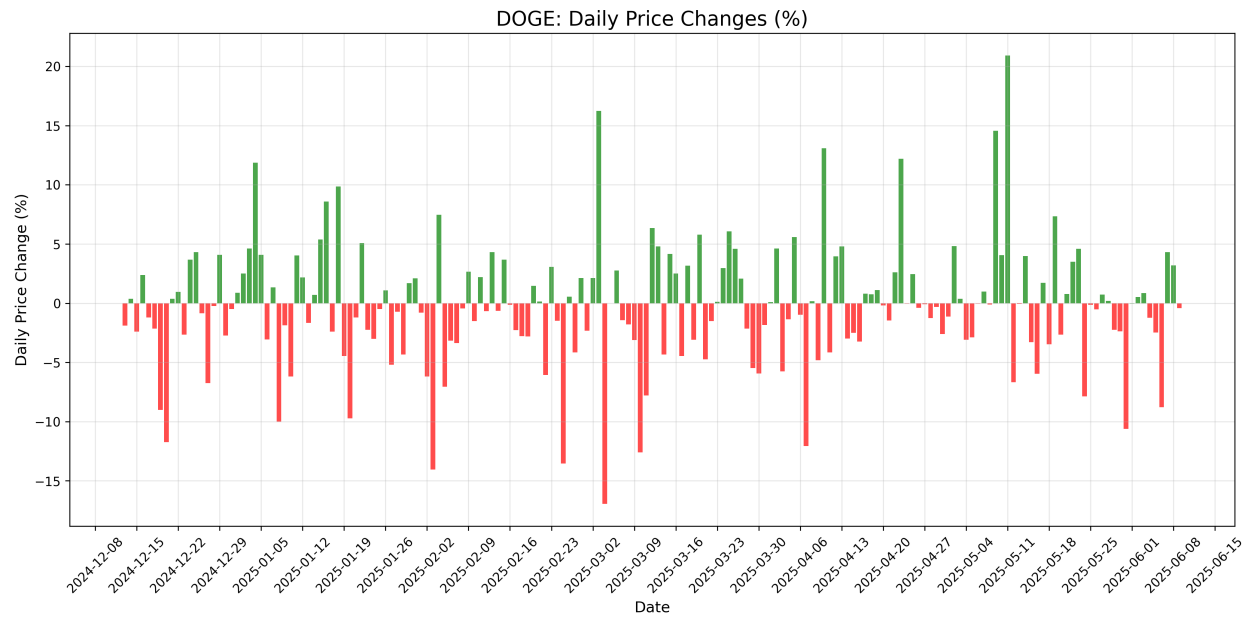
Parameter	Value
Base Rate	0
Kink	0.45
Multiplier	0.23
Jump Multiplier	5
Reserve Factor	0.3

DEX Pools

On chain market cap: \$ 1.94 M

Exchange	Pair	Volume (24 hr)	TVL	link
Aerodrome SlipStream	cbBTC / cbDOGE	\$ 2.9 M	~\$ 450 K	https://www.geckoterminal.com/base/pools/0x363d1607b8da83d6b6ea76d017ceecf1316bb08a
Aerodrome SlipStream	WETH / cbDOGE	\$ 145 K	~\$ 450 K	https://www.geckoterminal.com/base/pools/0xfb338cb462c9e44cae9f442feb09e8e904ffed47

Price Volatility



- Current cbDOGE 30d annualized volatility: 106.39%
- Comparing DOGE's volatility profile to other assets on Moonwell, it's more volatile than assets such as BTC and ETH, and less volatile than assets like AERO, VIRTUAL, and MORPHO.
- A large portion of DOGE's supply is heavily concentrated among retail traders. The largest wallet, a Robinhood cold wallet, holds 19.28% of the total coins (source).

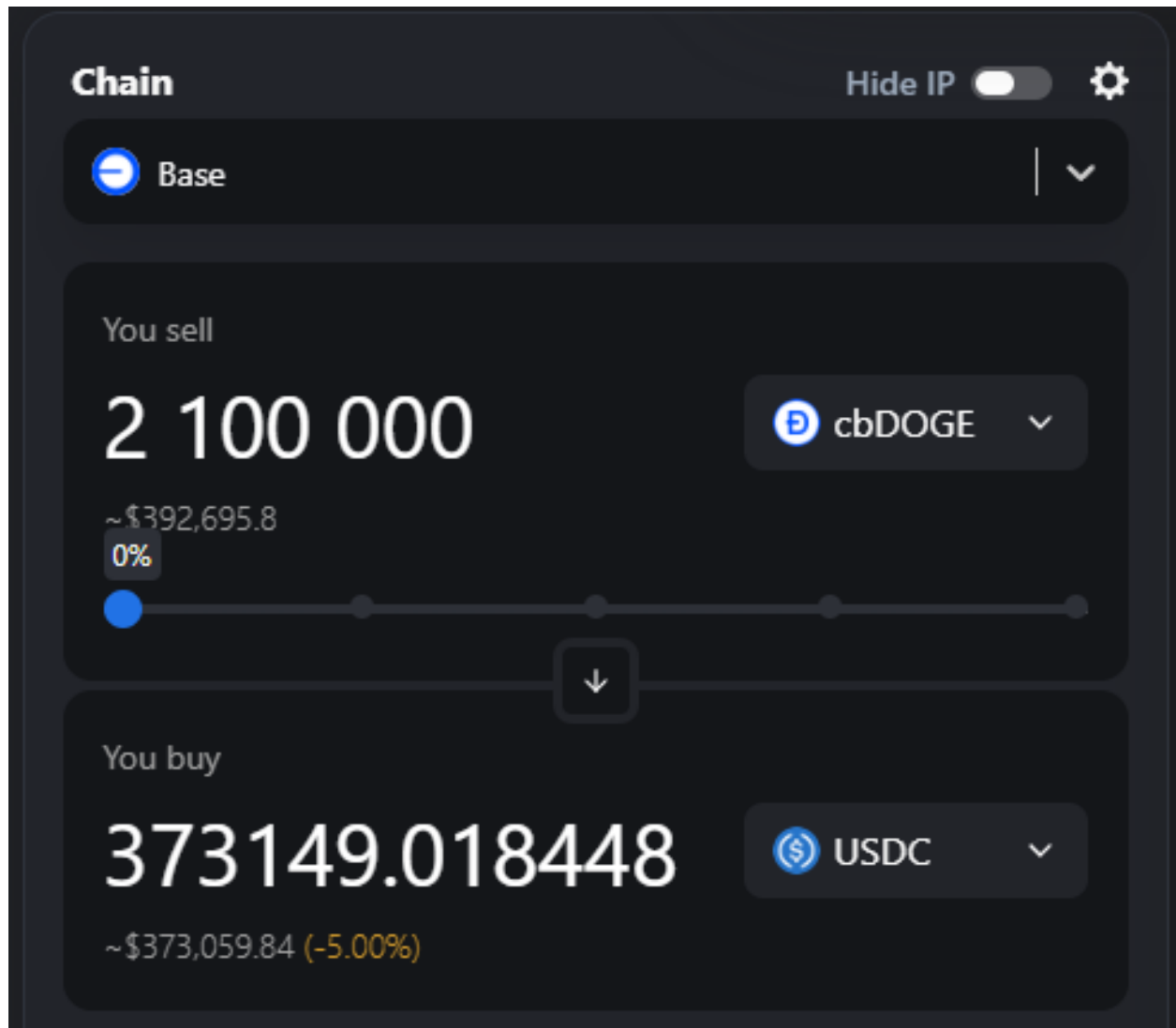


On Chain Supply

- approx 10M cbDOGE (source)
- Most cbDOGE is held by Coinbase (about 65%)
- Of the top 10 holders on Base, 8 are contracts (LPs).

Rank	Address	Quantity	Percentage	Value
1	Coinbase 3	6,808,118.09276693	65.4620%	\$1,271,640.72
2	0x363d1607...1316BB08A	1,710,179.61115343	16.4439%	\$319,432.48
3	0xfb338cb4...904fFed47	1,181,138.07450069	11.3570%	\$220,616.51
4	0x51C72848...784502a7F	288,835.21310851	2.7772%	\$53,949.51
5	0xbBf91495...0dB3a5feF	99,338.61977632	0.9552%	\$18,554.77
6	0xAf61B10B...2aFe468B9	72,553.2279152	0.6976%	\$13,551.71
7	0x7072BC83...15a154163	59,828.55901655	0.5753%	\$11,174.96
8	0xd13Da05B...E3428791F	45,802.17359056	0.4404%	\$8,555.07
9	0xc3B5B9e5...cb272334e	29,584.5735801	0.2845%	\$5,525.90
10	0x28138bFE...17fF2A7E1	20,921.54383438	0.2012%	\$3,907.79

Slippage



Selling 2.1M cbDOGE currently incurs <7% slippage (liquidator bonus). This represents approximately 40% of liquidatable collateral at max supply and borrow caps of 10M and 4.5M respectively. As cbDOGE has only been out for a week, we expect on-chain liquidity to continue to increase. Additionally, cbDOGE is fungible 1:1 with DOGE through Coinbase, granting access to deep liquidity from other centralized venues.

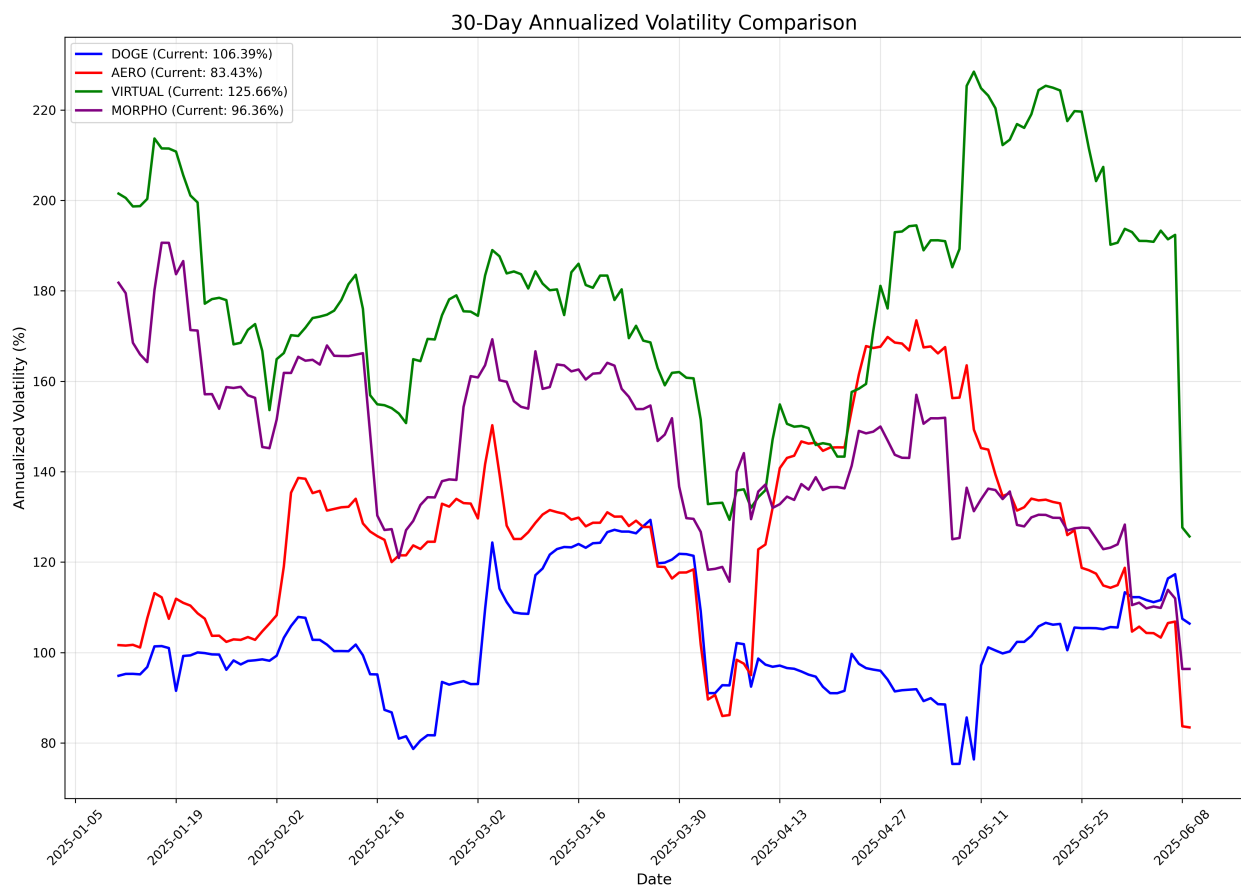
Supply and Borrow Caps

We recommend setting the supply cap for cbDOGE to 10 million tokens and the borrow cap to 4.5 million tokens. The supply cap is designed to approximate the total supply of cbDOGE on the base network, providing a safe ceiling without stifling growth. These caps are intended to create a secure lending environment where, in a worst-case scenario involving significant collateral liquidation, the platform can rely solely on DEX liquidity to manage

liquidations. This approach minimizes risks tied bridging cbDOGE through Coinbase to access liquidity from external sources, which liquidators should easily be able to do, but might not be immediately prepared for. Initially, these caps are set conservatively to evaluate lending demand and monitor market conditions, allowing for future adjustments as needed.

Collateral Factor

We recommend setting cbDOGE’s initial collateral factor to 65%, aligning it with volatile assets such as AERO, VIRTUAL, and MORPHO. Although cbDOGE’s risk profile may permit a higher factor, we suggest a gradual increase from this starting point during the asset’s onboarding phase.



IR Parameters

Borrowing DOGE is currently facilitated through CEXs, which typically offer APYs ranging from 4% to 14%. As lending DOGE is new to DeFi, we propose initial interest rate parameters designed to span a wide range of APYs. This flexibility aims to help determine the market-optimal rate based on demand and utilization.

The table below details the proposed borrow and supply annual percentage rates (APRs) at different utilization levels:

Utilization	Borrow APR	Supply APR
0	0	0
45	10.35%	3.26%
100	285.35%	199.74%

Conclusion

As cbDOGE is a novel asset, we will continue to monitor DEX liquidity, and expansion on Base. We will propose updated parameters as new information develops. As always, we are open to community feedback and happy to answer any lingering questions.