Bluechip

Stablecoin Safety Assessment

Coin	GHO (GHO)
Date	30-08-2023
Overall Grade	D (Unsafe)

Factor Scores:

S. No	Factor	Score	Assessment
1	Stability	0.58	Unstable
2	Management	1.00	Very low risk
3	Implementation	N/A	Not assessed
4	Decentralization	0.80	Low risk
5	Governance	0.70	Low risk
6	Externals	N/A	Not assessed

Summary

- GHO is a new USD-pegged stablecoin launched in July 2023 by Aave, a leading money-market protocol on Ethereum, and is fully governed by the Aave DAO.

- It is a CDP-style stablecoin that can be minted (borrowed) against collateral supplied into the Aave app.

- Since its launch, GHO has been consistently trading around $0.97-0.985.

- A reclaim of GHO's peg seems unlikely in the short term due to: (i) lack of strong stability mechanisms to enforce a $1 peg (ii) a low cost of borrowing GHO that incentivizes supply increases and (iii) anticipated sell pressure on GHO arising from a leveraged-yield strategy enabled by the onboarding of sDAI as collateral on Aave v3.

- While GHO has low Management, Decentralization and Governance risks, it does not meet the minimum standard for Stability. GHO holders are exposed to significant price risks. Due to low borrowing rates and no reserve redemption mechanism, GHO's price is more likely to drop further than increase.

- GHO, in its current form, is unsafe. We caution users against holding GHO.

  Despite our rating, we believe GHO already has many key ingredients in place to become a safe, decentralized stablecoin, provided that it implements stability-enhancing changes to its design.

  GHO's rating can be improved to a B+/B by:

  1) enabling redemption of GHO for collateral or

  2) enabling GHO as a collateral asset with high LTV

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Evaluation

1. Stability [**Score 0.58**]

    1.1. Reserves [**Score 0.88**]

        1.1.1. Collateralization % and Type of Collateral [**Score 0.88**]

GHO debt is predominantly collateralized by ETH (22%), ETH-staking derivatives (52%) and WBTC (15%). The collateralization ratio is 295%. GHO inherits the risk parameters of the Aave protocol.

Note: Please see the Mechanism section for an explanation of GHO's stability.

        1.1.2. Storage of Assets [**Score 0.75**]

Assets backing GHO debts are stored in Aave's native smart contracts which have been audited by several auditors including PeckShield, Sigma Prime, Trail of Bits, OpenZeppelin and ABDK.

Our score does not reflect whether Aave's smart contracts are technically sound and error-proof. It indicates the general relative safety of protocol-owned smart contracts over third-party smart contracts, multi-sig wallets and EOA accounts.

        1.1.3. Asset Segregation [**Score 1.00**]

GHO's reserves are fully segregated from Aave's treasury.

    1.2. Market Feedback [**Score 0.19**]

        1.2.1. Frequency of Deviation Below Peg [**Score 0.00**]

Although GHO has been trading for less than 180 days, it has traded below its peg since launch.

        1.2.2. Max Deviation Below Peg [**Score 0.00**]

GHO has traded as much as 3.3% below its peg (measured basis VWAP)

        1.2.3. Volatility (% per day) [**Score 0.75**]

Daily volatility (%) over the period since launch: 0.45%

        1.2.4. Downside Volatility in a Market Downturn [**Score 0.00**]

Although GHO has been trading for less than 180 days, it has traded below its peg since launch.

1.3. Stability Mechanism   [Score 0.34]

1.3.1. Core Mechanism   [Score 0.67]

GHO and Aave smart contracts incorporate two mechanisms for GHO's stability:

a) Liquidation - GHO is created when users open collateralized debt positions against their assets supplied to Aave as collateral. GHO is burned when borrowers repay debts along with interest. However, this mechanism does not directly help GHO maintain its peg. Instead, it is meant to ensure that the value of collateral is always greater than the value of GHO borrowed. Without a redemption mechanism, it is possible for GHO to trade at any value above or below $1 even if fully-collateralized.

b) Variable Borrow Rates – Aave DAO can influence the price of GHO by changing the cost of borrowing. The current interest rate is intentionally kept low to incentivize supply expansion of GHO.

Why do we consider GHO unsafe?

• Without a strong stability mechanism, GHO cannot enforce a $1 peg. Since its launch in July, GHO has been trading at a 2-3% discount to the US Dollar. Contrary to Aave's claims, arbitrage is NOT a stabilizing factor for GHO. Redeemability of collateral is a requisite for facilitating arbitrage. Arbitrage implies a risk-less profit opportunity, but that does not exist for GHO.

• There is not enough demand for GHO. When GHO is below $1, GHO demand can come from:

  (1) A user (who is not a borrower) can buy GHO and wait for the price to return to $1, but what guarantee is there that the peg will be regained? None, as this is not a strong enough incentive. In contrast, when a stablecoin with redeemability trades below its peg, a user can buy it for a discount knowing that he can sell it back to the protocol at the peg price immediately.

  (2) If a GHO-minter (borrower) buys GHO to repay the debt at a discount. There are two reasons why this may not be effective –

    a) This requires locking up capital upfront, so the cost of that capital needs to be considered. If the minter can generate a higher return than $0.03 (assuming GHO is $0.97) by deploying elsewhere, debt repayment is a less preferable option.

    b) GHO-minters are essentially shorting GHO by borrowing. If they believe that GHO is unlikely to regain its peg, it is in their interest not to repay the loans

and hope for GHO's price to drop even further, especially in the absence of a hard peg mechanism.

- In the current scenario of low liquidity and low cost of borrowing, more downside pressure on the peg is expected. For example, with the recent onboarding of sDAI (token representing DAI locked in Maker's DSR earning 5% p.a yield) as a collateral token on Aave v3, a leveraged-yield farming opportunity is created. Users may lock up DAI to obtain sDAI, then use sDAI as collateral to borrow GHO (borrow @1.5% p.a), swap GHO for DAI and repeat this loop several times.

- Aave is also set to launch the GSM (GHO Stability Module), which is similar to Maker's PSM. However, the GSM cannot help GHO regain its peg. It is important to note that the GSM is more useful to prevent GHO from going above $1, rather than preventing it from going below $1. The GSM is essentially a second mode of minting GHO, the first one being though overcollateralized borrowing. What this means is that there are two pools of reserves backing GHO, but only one of those pools (i.e, the GSM) can be used for redemptions. The implication is that redemption of GHO is only possible through the GSM to the extent of GHO minted through the GSM. The GSM will first have to go through a bootstrapping/minting phase to accumulate other stablecoins BEFORE it can be used for redemptions to stabilize the peg.

With no guarantees about GHO's peg resilience, we caution users against holding GHO.

1.3.2. Primary Liquidity Access [**Score 0.00**]

Holders of GHO (who are not GHO minters) cannot redeem GHO for underlying collateral. The only way to exit GHO is through on-chain liquidity pools. Further, even in an emergency scenario where the Aave protocol needs to be shut down, there is no documented mechanism to settle GHO holders using underlying collateral (as is the case with Maker's Global Settlement feature).

2. Management [**Score 1.00**]

2.1. Restrictions [**Score 1.00**]

2.1.1. Known Core Teams [**Score 1.00**]

GHO was developed by the Aave Companies, led by Stani Kulechov. The Aave Protocol is fully governed by the Aave DAO, but certain critical functions have been delegated to a group of community-elected individuals known as Guardians. These are prominent individuals within the crypto ecosystem.

2.1.2. Jurisdiction Score   [**Score N/A**]

The Aave DAO, which controls the Aave Protocol, does not have a legal structure in any jurisdiction. It is a set of DAO-controlled smart contracts on the Ethereum chain.

3. Decentralization   [**Score 0.76**]

3.1. Regulatory Oversight   [**Score 1.00**]

Aave and GHO are decentralized protocols governed by the Aave DAO. It is not subject to any regulatory oversight.

3.2. Custodian Risk   [**Score 1.00**]

Aave does not rely on custodians for storage of assets. All assets are held in the protocol's own smart contracts.

3.3. Type of Collateral   [**Score 0.79**]

GHO is predominantly backed by ETH, ETH-staking derivatives, and Wrapped Bitcoin.

(Centralized collateral assets earn a score of 0 and decentralized assets earn a score of 1).

3.4. Decision Making & Voting Power   [**Score 0.50**]

Aave is controlled by the Aave DAO. Per our estimates, at least 50% of the voting power in the protocol is not controlled by insiders.

(Note: This estimate is based on wallet-tags and may not be entirely accurate.)

3.5. User Blacklisting   [**Score 0.50**]

Although Aave's smart contracts are permissionless, the Aave front-end is not. In the past, Aave has blocked certain users from accessing the front-end website.

4. Governance   [**Score 0.70**]

4.1. Voting System   [**Score 1.00**]

Aave has deployed fully-decentralized community governance. All proposals are voted on by Aave holders (or their delegates) and voting outcomes are autonomously executed on-chain.

4.2. Anti-Governance Attack Measures   [**Score 0.40**]

Anti-governance attack measures can be classified into preventive and reactive measures.

1. <u>Preventive Measures</u> [0/0.50]

These measures help dissuade the attacker from carrying out the attack by locking up governance tokens before voting and/or granting differential voting power based on criteria that can increase the time and cost of performing an attack. Examples include vote escrow, pre-voting lockup cliffs, and time-weighted voting power.

Aave does not employ any Preventive Measures.

2. **<u>Reactive Measures</u>** [0.40/0.50]

These measures aim to prevent or suspend and reduce the impact of attacks that have already been initiated. Examples are time-delays, governance vetos, exit rights for stablecoins holders and emergency shutdowns.

Aave incorporates two reactive measures:

a) Time-locks: Aave's Governance relies on a shorter time-lock (1 day) for minor protocol upgrades such as parameter changes and asset listings and a longer time-lock (7 days) for changes that affect the core code base, such as governance.

b) Guardian: The Aave Community Guardian is a group of community-elected individuals or entities who are part of a 6/10 multisig. The Guardian can veto malicious Aave Improvement Proposals to prevent governance attacks.