

Stablecoin Safety Assessment

Coin	DAI
Date	04-06-2023
Overall Grade	B+

Factor Scores:

S. No	Factor	Score	Assessment
1	Stability	0.79	Stable
2	Management	1.00	Very low risk
3	Implementation	N/A	Not assessed
4	Decentralization	0.47	Moderate risk
5	Governance	0.79	Very low risk
6	Externals	N/A	Not assessed

Summary

- DAI is the oldest and most widely used stablecoin that is entirely issued, managed, and redeemed on-chain.
- DAI is issued by the Maker Protocol and managed by MakerDAO.
- While the Maker protocol is decentralized to a large extent, DAI is predominantly (~72%) backed by centralized assets such as USDC, USDP, GUSD and other off-chain assets.
- In our assessment, DAI is one of the safest on-chain stablecoins, having stood the test of time by surviving multiple crises.
- DAI, in its current form, is ideal for users (a) who want a permissionless protocol and risk-managed, volatility-minimized reserves, and (b) to whom DAI's centralization risks do not mean much.

Evaluation

1. Stability

[Score 0.79]

1.1. Reserves

[Score 0.87]

1.1.1. Collateralization % and Type of Collateral

[Score 0.82]

DAI's reserves comprise fiat-backed stablecoins & stable pool LP tokens (47%), ETH and ETH-staking derivatives (21%), real world assets (28%) and other crypto assets (4%).

Collateralization Ratio of DAI by type of collateral:

- DAI from stablecoins and stable pool LP tokens - $\geq 100\%$
- DAI from ETH and staking derivatives - $> 420\%$
- DAI from real-world assets - $> 110\%$
- DAI from other crypto assets - $> 230\%$

In our view, DAI is more than sufficiently collateralized. The protocol collateralization ratio of 180% can be misleading at first glance.

1.1.2. Storage of Assets

[Score 0.80]

~45% of DAI's reserves are held in Maker's fully audited contracts. These contracts have been audited by Trail of Bits and PeckShield.

~38% of reserves are held off-chain in real world assets such as US Treasury ETFs, real estate and business loans. These assets are held under a regulated trust structure subject to US laws, for the benefit of MakerDAO.

We observe minimal storage risk with respect to the assets mentioned above and assign the highest possible scores. However, the remaining reserves are held in third party contracts (15%) and multi-sigs (2%), both of which we believe entail higher risks.

Note: Our score does not reflect whether Maker's smart contracts are technically sound and error-proof. Rather, 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]

ETH reserves are fully segregated for the benefit of DAI holders and vault owners.

1.2. Market Feedback [Score 0.55]

1.2.1. Frequency of Deviation Below Peg [Score 0.50]

Number of Days where VWAP < Peg by 0.5% or more during the past 180 days = 2

1.2.2. Max Deviation Below Peg [Score 0.00]

Biggest daily VWAP deviation below peg: 3.3%

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

Daily volatility (%) over the past 180-day period: 0.35%

1.2.4. Downside Volatility in a Market Downturn [Score 1.00]

Average deviation below peg during the 5 worst-performing days for BTC (DoD price change) in a 180-day period: 0.02%

1.2.5. Liquidity Pool Imbalance [Score 0.50]

3Pool (USDC/USDT/DAI)

- DAI Share of Pool - 37%
- Pool Type - 3 Token
- Optimal Share of DAI - 33%
- Deviation from Optimal Share - 11%
- Non-DAI TVL in the pool - \$243,234,977
- Pool Score - 0.5

1.3. Stability Mechanism [Score 0.82]

1.3.1. Core Mechanism [Score 0.89]

The current version of Maker's contracts incorporates two mechanisms for DAI's price stability:

a) The Peg Stability Module (PSM) - The PSM allows DAI to be minted by depositing governance-approved fiat-backed stablecoins such as USDC, USDP and GUSD. This helps prevent the price of DAI rising above \$1. The PSM can also be used to redeem DAI for other stablecoins in the PSM to prevent the price of DAI falling below \$1, albeit only when the PSM has a positive balance of stablecoins.

The PSM is like the arbitrage mechanism used by fiat-backed stablecoins and is highly reliable. (Score 1/1)

b) Liquidation - Before the introduction of the PSM, opening and closing vaults (collateralized debt positions) were the only ways to mint and redeem DAI. However, this mechanism does not directly help DAI maintain its \$1 peg. Instead, it is meant to ensure that the value of collateral in vaults is always greater than the value of DAI borrowed by vault owners. It is possible for DAI to have traded at any value above or below \$1 even if fully-collateralized. Without redeemability, there is no other mechanism to guarantee DAI's \$1 peg. (Score 0.67/1)

DAI's core mechanism score is driven by the ratio between DAI created through the PSM (63%) and DAI created through vaults (37%).

Score = 0.78 [67% x 1 + 33% x 0.67]

Why do we consider DAI safe?

- Each collateral asset backing DAI is more than sufficiently collateralized to handle liquidations effectively.

Collateralization Ratio of DAI by type of collateral:

- o DAI from stablecoins and stable pool LP tokens - $\geq 100\%$
 - o DAI from ETH and staking derivatives - $>420\%$
 - o DAI from real-world assets - $>110\%$
 - o DAI from other crypto assets - $>230\%$
- Further, only 28% of DAI in circulation is attributable to vaults with volatile collateral subject to the liquidation mechanism.

1.3.2. Primary Liquidity Access

[Score 0.75]

DAI can be redeemed for collateral only through the PSM. 67% of the DAI in circulation can be redeemed through the PSM, while the rest can be redeemed only when the protocol enters the Emergency Shutdown mode.

DAI's PSM contains USDC, GUSD and USDP. In addition, we also consider yield-generating balances held by Coinbase Custody and Monetalis Clysedale as part of PSM balance.

2. Management

[Score 1.00]

2.1. Restrictions

[Score 1.00]

2.1.1. Known Core Teams

[Score 1.00]

MakerDAO does not have a management team. Instead, it consists of Core Units, functional teams that furthers the DAO's objectives. Core Units are created through governance proposals that are voted on by \$MKR holders and delegates. Each Core Unit has a specific mandate and is responsible for the day-to-day decision making within such mandate. Pre-defined powers through mandates mitigate the risk of adverse management decisions, both in terms of scope and magnitude.

However, it is worth noting that despite the decentralized structure of MakerDAO, Rune Christensen, the founder, is believed to control more than 50% of the voting power locked in the Maker Protocol, enough to sway any governance proposal.

2.1.2. Jurisdiction Score

[Score N/A]

MakerDAO does not have a legal structure in any jurisdiction.

2.2. Track Record

2.2.1. Team's Background

[Score N/A]

Not scored

3. Decentralization

[Score 0.47]

3.1. Regulatory Oversight

[Score 0.25]

Regulatory overview increases the risk of censoring endpoints of the stablecoin's network (such as the issuer, banks and custodians) as well as users. A score of 0 indicates a high degree of government censorship risk.

While DAI is not directly subject to regulatory oversight, 72% of DAI's reserves consists of regulated, fiat-backed stablecoins, US Treasury ETFs and other loans issued by US regulated banks. 22% of assets are cryptocurrencies and the balance comprises stable LP tokens.

DAI's score is the weighted average of the scores of each collateral asset.

Score: = $(72\% \times 0) + (22\% \wedge \times 1) + (6\% \wedge \wedge \times 0.5) = 0.25$

\wedge - 22% of DAI's reserves consist of crypto assets

$\wedge \wedge$ - 6% of DAI's reserves consist of DAI-USDC LP tokens. A score of 0.5 is assigned based on DAI and USDC (pool mix ignored)

3.2. Custodian Risk

[Score 0.61]

DAI's score is the weighted average of the custodian scores for each collateral asset (USDC, USDP, GUSD, real world assets, ETH and ETH-staking derivatives, other cryptocurrencies etc.)

3.3. Type of Collateral

[Score 0.24]

When evaluating decentralization, it is important to consider the extent to which the stablecoin's value is tied to a central authority or external fiat currency. Monetary policies / decisions taken by such authorities / central banks can have an impact on the purchasing power of the collateral.

DAI is predominantly (~83%) backed by USD-denominated real-world assets and fiat, which are subject to the monetary policies of the United States.

(Fiat currencies earn a score of 0 and decentralized cryptocurrencies earn a score of 1)

3.4. Decision Making & Voting Power

[Score 0.25]

The Maker Protocol is governed by the MKR token. The governance system requires MKR holders to lock up their governance tokens to participate in voting. Currently, Rune Christensen, the founder of MakerDAO, is believed to control more than 50% of the locked MKR tokens and therefore can influence all

voting outcomes.

3.5. User Blacklisting

[Score 1.00]

DAI's smart contracts currently do not support blacklisting of specific user wallets.

4. Governance

[Score 0.79]

4.1. Voting System

[Score 1.00]

We look at whether the protocol has a binding voting system enforced by automated on-chain execution of proposals.

In the Maker protocol, outcomes of successful proposals are executed on-chain automatically.

4.2. Anti-Governance Attack Measures

[Score 0.57]

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

1. Preventive Measures [0.34/0.5]

These help dissuade the attacker from carrying out the attack in the first place 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.

In Maker, all voters are required to lock up their MKR in a smart contract prior to voting. Since all votes are subject to a time-delay, the MKR is not withdrawable until the vote has passed or failed. However, this is not the most ideal measure since the cost of the attack is only 24 hours.

2. Reactive Measures [0.8/0.5]

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

Maker incorporates two reactive measures - time-delays and emergency shutdown - to protect vault owners and DAI holders alike.

DAI's score is the sum of [1] and [2].