Corruption is not enough

Butter

December 2022

Contents

1 Butter

Butter is a DAO governance system. Its objective is to align DAO governance outcomes to DAO objectives through the direct application of incentives.

This paper describes a prototype, Molten, that attempts to influence DAO stakeholders and governance participants to cooperate using one-off payments.

2 Summary

One token, one vote mechanisms are the most popular governance mechanisms used by DAOs. However, one token, one vote and other token voting systems are plutocracies and widely considered vulnerable to corruption and attack.

Large or mature DAOs, and many newer DAOs, have introduced vote delegation in an attempt to scale governance and alleviate the risks of plutocracy.

However, many recent and well-known examples of plutocracy involve DAOs, including ENS DAO, Sushi DAO, and MakerDAO, in which vote delegation is allowed and often enforced.

We examine the DAO governance problem space and highlight promising in-market solutions, including hybrid governance, metagovernance, and market-based governance.

We propose cryptoeconomics, a system of economic incentives designed to produce behaviours at the micro scale that create desirable, emergent properties at the macro scale, as a viable solution space for further exploration.

Finally we describe Molten, a system that aims to address the risks related to plutocracy in DAO Governance using incentives designed to make corruption an unprofitable strategy.

3 Motivation

3.1 Decentralised Autonomous Organisations

DAOs are a novel form of organisation, uniquely enabled by blockchains.

The components of an organisation include, but are not limited to:

1. an **objective** or **purpose**
2. a **membership policy** that produces a set of members, e.g. holds shares, holds tokens, is contracted, etc.
3. an **allocation mechanism** which defines how the organisation allocates resources
4. a **standardised store of value** which defines how the organisation values and represents its resources, e.g., currency, equity, tokens

5. a **governance mechanism** which defines how to update the organisation's properties, e.g. membership policy, allocation mechanism, etc.

DAOs, through their use of blockchains, claim to provide the benefits of large-scale coordination without the downsides of centralization. These downsides inlcude capture, corruption, and collusion—-problems that undermine our most-trusted institutions.

Generally, DAO proponents expect DAOs to replace traditional institutions in the provision of public, common, or club goods. When these institutions fail, centralisaion is usually a root cause, e.g. bureaucracy, corruption, principal-agent problems.

In practice, however, it appears that DAOs do not offer effective solutions to these problems and often move them elsewhere in the value chain1. Current DAO implementations, therefore, remain vulnerable to the same issues faced by our incumbent institutions.

3.2 DAO Governance

*DAO governance involves a network of participants that coordinate to make decisions, **without a centralised actor with privileged rights,** in pursuit of some goal or outcome, and is formalised or defined under set of shared context(s), e.g. a geography, the law, a market, a cause, etc.*

DAOs, like other organizations, implement internal policies that govern their components and the interactions between them. This includes the law in the case of nations, compensation, taxation, resource allocation, social choice, etc.

DAOs are similarly governed by external policies enforced by their environment, such as the law in the case of corporations, market forces, international relations, physics, blockchain protocols, etc.

Governance mechanisms can, therefore, be considered the component of DAOs responsible for mediating all DAO components. They are, in turn, mediated by their environment and competing DAOs.

For the purposes of improving its outcomes, a DAO's governance mechanism could be considered the DAO itself. Therefore, we expect improvements in DAO Governance to be an effective means to realising the expected positive value of DAOs on society.

3.3 DAO Governance Models

Note: We recognise that token-voting, though democratic in nature, is far from a democracy in the literal sense. However, we will use the term democracy to adhere to market convention

Models include:

- Direct Democracy
- Representative Democracy
- Reputation-based Voting

3.3.1   Direct Democracy

One token, one vote on every proposal

Description

In a direct democracy, token-holders make decisions by voting on proposals, where each token is equivalent to a vote. Currently, this is the governance mechanism used by the majority of DAOs, especially smaller, younger DAOs.

Governance must configure the following parameters:

- Who has the right to create a proposal
- How to convert token votes to a decision, e.g. majority-rule, supermajority, quorum rules

Benefits

- Bundling financial upside and governance rights aligns risk and responsibility, which incentivises those with the most to gain from price appreciation to make decisions that directly or indirectly maximise price appreciation
- This replicates features of the equity system, which makes it simple for holders to understand

Limitations

- Keeps out those who may be affected by governance but don't have the capital to acquire governance rights
- Tends towards plutocracy which, if left unchecked, leads to failure through a focus on price appreciation, regardless of negative externalities

Examples

- PleasrDAO, Aavegotchi, VitaDAO

3.3.2   Representative Democracy

One token, one vote on every proposal with vote delegation

Description

In a representative democracy, token-holders make decisions by voting on proposals, where each token is equivalent to a vote, but can also delegate their voting power to a representative. Delegated voting is increasingly becoming the most popular governance mechanism, especially for mature, large DAOs.

Governance must configure the following parameters:

- Who has the right to create a proposal

- How to convert token votes to a decision, e.g. majority-rule, supermajority, quorum rules
- Which rights can be delegated and to whom

Benefits

- Aligns incentives by unbundling financial risk and governance power and allocating them to domain experts
- Allows governance rights to accrue to representatives whom voters believe are best placed to represent their preferences
- Reduces voter apathy

Limitations

- As delegation scales, the nuance of voter preferences is diluted to the preferences of a smaller subset of voters, i.e. the delegates, which is less representative of the population
- Forces the voter to find a single delegate who represents their entire range of preferences across all possible decisions (though tokens could be split across wallets or delegation functionality enhanced)
- Allowing voters to delegate enables a more persistent form of voter apathy, as seen in our traditional political system

Examples

- Uniswap, Gitcoin, Compound, ENS, MakerDAO, AAVE, Radicle, Nouns DAO

3.3.3   Reputation-based Voting

One person, one vote OR One contribution/reputation unit, one vote on every proposal

Description

Non-transferable voting based on your membership, reputation and, or contribution.

Benefits

- more equitable relative to token-weighted voting, i.e. meritocratic
- aligns contribution and power
- does not produce plutocracy

Limitations

- only as performant as the system's ability to measure contributions and assign relative value
- assumes equal exposure to externalities
- inability to express preference intensity

Examples

- Optimism's Citizen's House

4 Problems

4.1 Problem Space

The problem space is defined as DAO Governance, in particular:

- DAO Governance Corruption, including Capture, Collusion, and Opportunism
- DAO Governance Attacks, including Capital Structure Exploitation

4.2 Properties

- **Stakeholder.** Any individual, collective, or entity that experiences externalities due to the actions of the DAO, e.g. Token-holder, user, delegate, staker/miner, etc.
- **Participant.** Any individual, collective, or entity that participates in governance
- **Preference.** A stakeholder's subjective, comparative evaluations over a range of options, e.g. a miner prefers to increase the block reward, over reducing rewards or keeping rewards constant
- **Objectives.** The goal or set of goals that constitute the DAO's organizing purpose, e.g. "Buy the constitution", "Fund Public Goods"
- **Acts.** The set of actions or decisions the DAO's governance mechanism is able to produce and its stakeholders consider, e.g. Add a new asset as collateral in our lending protocol, remove a particular voter's voting power, increase token supply, offboard a contributor, suspend the protocol
- **Outcomes.** The set of outcomes the DAO's governance mechanism is able to achieve through its actions, e.g. Token Price increases or remains stable, protocol users increase

4.3 Dimensions

To measure the effectiveness of a DAO's governance, we consider the following dimensions:

- **Stakeholder Representation.** The distribution of voting power relative to DAO stakeholders, i.e. users, token holders, stakers, liquidity providers, etc.
- **Preference Representation.** The degree to which governance participants are able to express their preferences with respect to the DAO's objectives, e.g. I do not believe the voting mechanism is legitimate
- **Alignment.** The consistency of a decision when compared to a desired outcome
- **Coherence.** The consistency of a series of decisions when compared to one another, with respect to a desired outcome

- **Legitimacy.** Power granted by governance participants to the governance mechanism through their ongoing implicit agreement to be bound by its decisions

4.4 Problems

4.4.1 Corruption Problems

Opportunism   Where a single stakeholder or group of stakeholders is rewarded for acting in their own self interest while punishing all other stakeholders and producing outcomes that do not align with the DAO's objectives.

Example: Proposing or voting for salary increases or against salary cuts during a budget-cutting exercise.

Symptoms: - Deviation between outcomes and objectives - Increase in actions or decisions that do not align with objectives - Illegitimate diversion of funds

Capture   Where a minority group of stakeholders possess the power to dictate the DAO's actions to serve their own preferences while punishing all other stakeholders and producing outcomes that do not align with the DAO's objectives.

Example: Plutocracy, Bureaucracy

Symptoms: - Deviation between outcomes and objectives - Increase in actions or decisions that do not align with objectives - Illegitimate diversion of funds

Collusion   Where two or more stakeholders or stakeholder groups that operate within or outside the boundaries of the DAO cooperate for their mutual benefit, to the detriment of all other stakeholders and the DAO's ability to achieve its objectives.

Example: Vote Buying

Symptoms: - Deviation between outcomes and objectives - Increase in actions or decisions that do not align with objectives - Illegitimate diversion of funds

4.4.2 Attack Problems

Capital Structure Exploitation   Where an individual or group is able to exploit vulnerabilities in the DAO's governance mechanism to extract capital.

Example: Treasury Drain Attacks, Price Manipulation Attacks, Arbitrageurs, etc.

Symptom: - Illegitimate diversion of funds

5 Governance Innovations

DAO Governance, unlike corporate and public governance, is both public and open source. The principles of the open source community, that anyone can copy and reuse for free, provides many opportunities for governance innovation—-some of which we've shared below.

Metagovernance, Hybrid Governance, and *Market Governance* are three categories of governance innovation that may offer effective solutions with respect to our problem space.

5.1 Metagovernance

Metagovernance, in the context of DAOs, is the term commonly used to describe any activity where one governance mechanism, typically a protocol or a DAO, exerts influence on the governance of another DAO.

Metagovernance is a transparent, often automated, vote-buying mechanism that incentivizes a target DAO's token-holders to take an action that benefits the mechanism's stakeholders, e.g. influence over governance decisions, direction of token emissions, etc.

Metagovernance creates a secondary set of incentives, or meta-incentives, that augment the behaviour of the target DAO's stakeholders.

In one-off instances of metagovernance, such as in the case of Fei and Index Coop, the Fei team were able to gain influence in AAVE's governance using Index Coop's AAVE holdings.

There are also extended forms of metagovernance with DAOs whose entire purpose is to control the governance of other DAOs, such as Convex Finance.

5.1.1 Curve emissions with Convex Finance

Convex was designed to maximise control over CRV emissions on the Curve protocol.

Convex works by reimplementing Curve's vote-escrow token mechanic to pay CRV holders with CVX emissions in exchange for locking their CRV tokens in Convex's contract.

Convex, in turn, locks these CRV tokens using Curve's contracts to maximize their CRV emissions, which they share with CVX holders, and voting power, which they use to vote for increased token emissions for pools selected by CVX holders.

As of this writing, the Convex protocol controls 51% of all vote-escrowed CRV, an indicator of the effectiveness of meta-incentives in one-token, one-vote governance mechanisms.

5.1.2 Redacted Cartel, Hidden Hand

Hidden Hand from Redacted Cartel facilitates vote-buying campaigns for participating DAOs.

Vote buyers, or bribers, can deposit bribes for governance proposals at participating DAOs and users can delegate governance tokens to the Hidden Hand protocol. The protocol then distributes votes to maximise returns for its users in exchange for a 4% commission of bribes received.

As an example, as of September 7, 2022, $851,364 worth of bribes were deposited for 61 proposals on Aura Finance and $2,346,024 was deposited for 27 proposals on Balancer.

Hidden Hand also allows partners to implement their own bribe marketplaces so users can sell votes to bribers directly.

5.1.3 FEI Asset Listing on AAVE with Index Coop

Index Coop, a provider of token indexes, actively encouraged metagovernance for a small number of the tokens held in their DeFi Pulse Index, namely Maker, AAVE, and Compound–a service they promoted as metagovernance-as-a-service.

Under this arrangement, holders of INDEX tokens could use governance tokens held as part of the index service to make or vote on proposals within MakerDAO, AAVE, and Compound.

In September 2021, Fei protocol, a stablecoin issuer, created a proposal to list the FEI token on AAVE, using the AAVE token holdings in Index Coop's DPI.

AAVE's governance, specifically, requires 80,000 AAVE tokens before a holder can make a governance proposal. At that time, AAVE was trading at $327.04, setting the cost of proposal creation on AAVE at over $26m.

As a result of metagovernance, the Fei team were able to use $4m of INDEX tokens to control over 118,000 AAVE, worth ~$36m, allowing the team to successfully list their token on AAVE.

5.2 Hybrid Governance

Hybrid governance is here defined as the combination of two or more governance models within a single DAO governance mechanism.

This approach is typically pursued where DAO governance designers believe that outcomes can be better-aligned to the DAO's objectives by limiting the influence of stakeholders whose preferences are over-represented in a one-token, one-vote model.

Hybrid governance can also be implemented to give greater weight to the preferences of a group of stakeholders who are underrepresented or have no

means to express their preferences except to "vote with their feet", which is a loss for all stakeholders.

Hybrid governance modulates the influence of one set of stakeholders by distributing voting rights to another set of stakeholders, especially groups who may be marginalised by the preferences of dominant voters.

Voting power is redistributed until each group is able to provide sufficient checks and balance on the power of other groups.

5.2.1   Lido's stETH Dual Governance

LidoDAO's is governed by LDO holders. Unfortunately, users that stake ETH in the Lido contract receive stETH, which confers the holder no voting rights.

This structure allows Lido holders to make decisions that benefit LDO holders at the expense of stETH holders.

The goal of Lido's Dual Governance proposal "is to prevent the Lido DAO governance from changing the covenant between the protocol and stakers without consent from the latter."

The proposal grants stETH holders a vetocracy over proposals that are deemed to break the agreement under which users stake their ETH on Lido. stETH holders can signal their disagreement with a proposal by staking stETH in a vote escrow contract and once a minimum threshold is reached the proposal will be temporarily blocked to allow the community to negotiate. stETH holders can vote to block, amend, or pass the proposal after negotiations.

This power gives stETH enough power to limit opportunism by LDO token holders without burdening stakers with ongoing governance overhead.

5.2.2   Optimism's Hybrid Governance

Optimism, through the Optimism Collective have implemented a bicameral legislative process, comprising a 'Token House' within which voting powers are granted through token ownership, and a 'Citizens' House', within which voting powers are granted through non-transferrable NFTs or "soulbound tokens".

The Citizen's House's remit appears to be reserved for retroactive public goods funding whereas the Token House has a more traditional DAO governance remit, e.g. governance fund grants, protocol upgrades, director removal, etc. The team explains that this approach is "a large-scale experiment in non-plutocratic governance" but, so far, there are limited details.

5.3   Market Governance

Market Governance is co-opted from Market Governance Mechanisms to describe a mechanism that leverages the competitive forces of the open market to influence the behaviour of stakeholders.

As DAOs have scaled in scope, market cap, and contributors, token-based governance has created opportunities for corruption and in-fighting, especially where the DAO's operations are complex.

As the range and diversity of stakeholders increases, and the potential set of actions and decisions expand, governance must increase its throughput to accommodate, without creating a self-serving bureaucracy.

5.3.1   MakerDAO's MetaDAOs

The solution proposed by Rune in Endgame constitutes a decomposition of MakerDAO into a single core DAO housing the main functions of the Maker protocol and a collection of smaller "MetaDAO" governance units with their own governance and governance token. "MetaDAOs" have the freedom to pursue any viable market opportunity, while leveraging the resources of the core DAO.

This innovation affords MakerDAO the ability to maintain a small number of governance-controlled parameters for the core protocol, while the market provides the incentives to steer MetaDAO governance to the pursuit of new market opportunities.

This governance upgrade is in the process of being deployed at MakerDAO so its effects are yet to be measured.

6   Proposal

Each governance innovation provides a tool for addressing problems in DAO Governance.

Metagovernance provides a system of secondary incentives to reward governance participants for taking a set of desired actions, which is useful for limiting opportunistic behaviour.

Hybrid Governance redistributes voting power among stakeholders using a secondary governance mechanism. The second mechanism provides a system of checks and balances between the two groups, guaranteeing a system can never be captured by a single group of voters operating under a single mechanism.

Market Governance decomposes governance into self-contained organisations, allowing market forces to govern each organization's decisions. As a result, organizations that become bureaucracies, or engage in corrupt practices are outcompeted by those that are consistently productive.

These mechanisms improve stakeholder cooperation and alignment using three types of incentives. *Metagovernance* incentives are provided by a mechanism or protocol. *Hybrid Governance* relies on incentives which are provided by other stakeholders or peers. *Market Governance* incentives are provided by the market through competition.

Should governance attack, corruption, or capture be detectable by a governance mechanism, other stakeholders, or competing mechanisms, incentives offer an opportunity to offset the proceeds of these acts, rendering them unprofitable.

Through our investigations in the field of cryptoeconomics, we aim to design a mechanism or collection of mechanisms capable of providing sufficient guarantees about cooperative behaviour in DAOs.

Next, we present an initial exploration of the solution space.

7 Molten

Molten is WIP. This document will be updated as we conduct ongoing research and development.

Molten incentivizes voters to pool their votes to deter opportunistic behaviour by large token holders.

7.1 Actors

Molten is designed to coordinate the actions of three actors:

Representative. Stakeholder that wants to accrue voting power but lacks resources. Equivalent to a delegate in a DAO with vote delegation.

Voter. Stakeholder that wants protection against large voters and has adequate resources.

Target DAO. DAO that wants to allocate resources in pursuit of its objective.

7.2 Components

Molten is comprised of:

Campaigns. A period of time within which Voters pool their tokens in order to delegate voting power to a Representative. Can be launched by Representative once Campaign threshold is achieved, e.g. 100,000 governance tokens deposited.

Campaign Manager. Contract that manages all Campaigns, including types, parameters, and rewards.

Molten Pot. Contract created by Representatives to lock tokens during a Campaign. Voters deposit and claim tokens from Pots. Deposits are frozen once a Campaign is launched.

Molten Pot Factory. Contract used to create Pots.

Reward. Fixed token reward, e.g. 30,000 DAI, claimable in proportion to Voters' Pot claim at the end of a Campaign.

mTokens. Tokens issued to Voters during a Campaign. Each token represents a proportional claim on the underlying governance tokens and rewards locked in the Pot contract.

7.3 Operation

1. Molten uses the Campaign Manager to create a new Campaign Type and sets Campaign duration, Target DAO Governance Token (ERC20)

2. Representatives create Campaigns and broadcast their Campaign and Molten Pot contract address to Voters

3. Voters deposit tokens into Molten Pots attached to Representatives they believe will pool the most voting power for a Campaign

4. Target DAO deposits Reward in the Campaign Manager for the respective Campaign Type and sets Campaign threshold

5. Once a Molten Pot attached to a Representative exceeds the Campaign threshold, the Representative can launch the Campaign. This ends all other Campaigns of the same type, allowing Voters to claim tokens from the Molten Pots

6. Once the Campaign is launched, Molten Pots delegate pooled governance token voting power to Representatives, e.g. AAVE, and issue mTokens to Voters, e.g. mAAVE

7. Once the Campaign duration is reached, the underlying governance tokens and Rewards are claimable from the Molten Pot & Campaign Manager

8. During the campaign, should mToken holders decide that a Representative is no longer protecting their interests they can vote to terminate the Campaign, removing the Representative's voting power and forfeiting the Reward for all parties

7.4 Outcome

Molten combines peer incentives, used to incentivize Representatives to identify governance capture and corruption and increase stakeholder cooperation, and market incentives, to surface and distribute voting power to the most competent and motivated Representatives capable of keeping powerful voters in check.

We expect peer incentives will provide sufficient rewards to Representatives that identify corruption or capture2, in the form of delegated voting power, to limit potential gains from either strategy, creating an effective deterrent.

We expect market incentives to encourage competent Representatives to emerge, able to monitor and counter opportunism by large voters.

Given the presence of both peer incentives and market incentives, we believe that coordination costs are the most significant barrier to voters pursuing a

collective voting strategy. We hope to prove the effectiveness of an incentive on voter coordination.
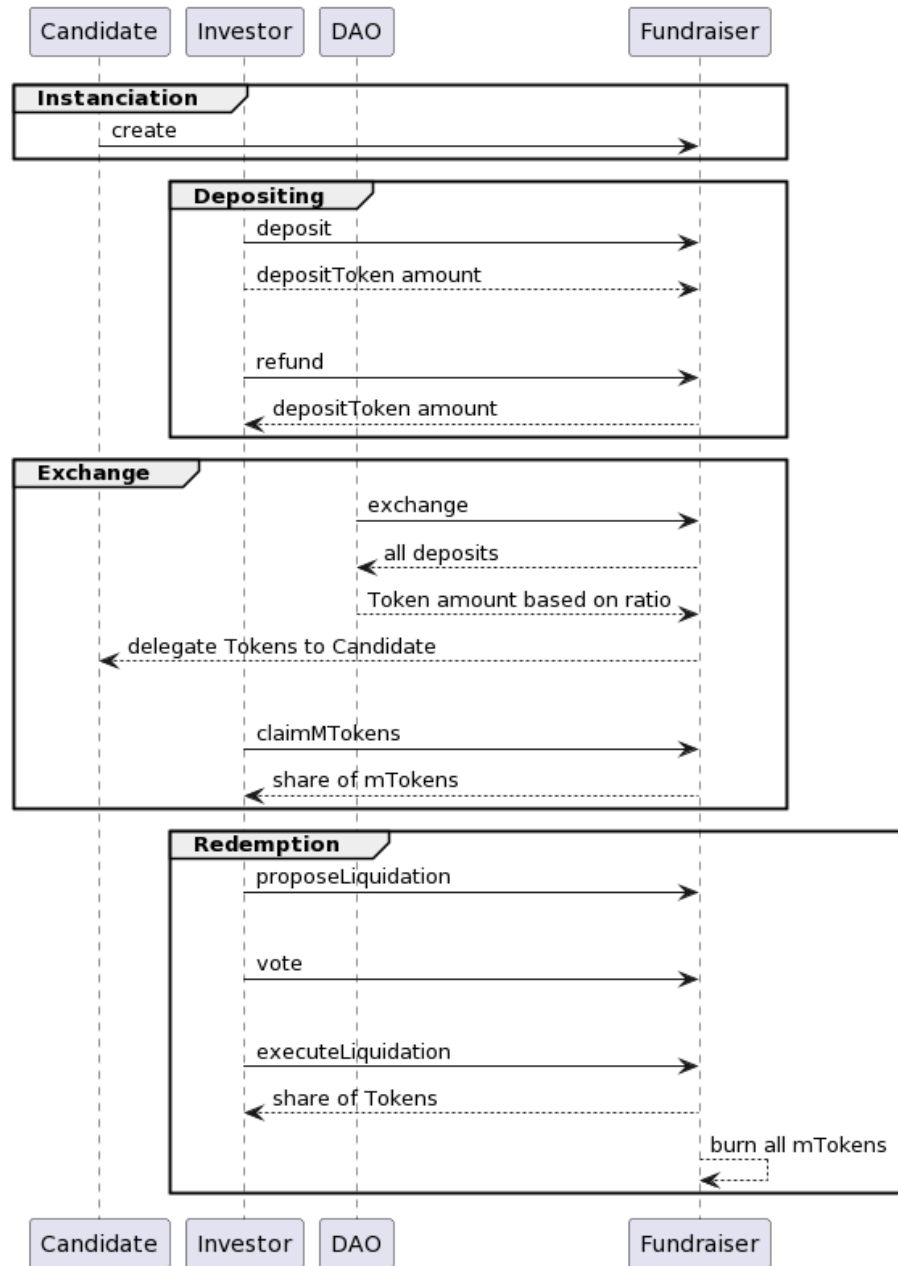
7.5 Implementation

A prototype implementation can be seen here.

8 Molten v1

Figure 1: Sequence diagram