



UNIVERSITY *of* NICOSIA

Session 5.1

DeFi Governance

BLOC 611: Decentralized Finance

Objectives

- Introduce the concept of governance and decentralized governance and outline the similarities/differences between the two
- Explore one of the cornerstones of decentralized governance, Decentralized Autonomous Organizations
- Present the governance models of popular DeFi protocols and invite discussions on their level/degree of decentralization
- Analyse the shortcomings of decentralized token governance and present some potential solutions

Agenda

1. Governance and decentralized governance
2. Decentralized Autonomous Organizations (DAOs)
3. How decentralized is “decentralized governance”?
4. Beyond token governance
5. Conclusions

Disclaimer: As usual, the inclusion of any particular blockchain project or organisation is for educational purposes only. This should not be construed as an endorsement or investment advice.

Session 5.1: DeFi Governance

1. Governance and Decentralized Governance

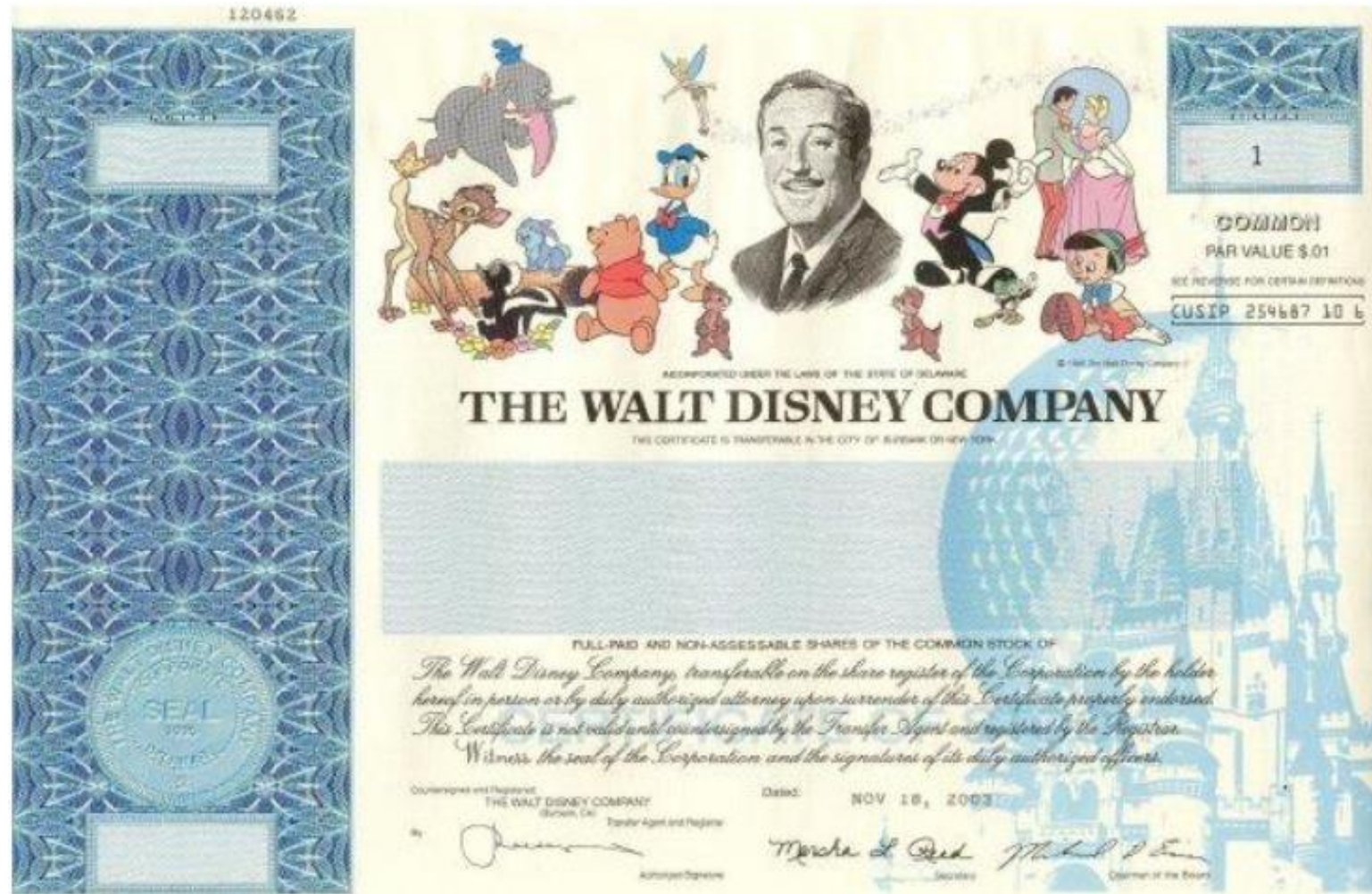
What is **Governance**?

- Governance is a framework of **rules** and **procedures** that regulates conduct of participants of a network.
- Although governance is historically associated with centralized political activities, in practice it applies to everything, from commercial interactions to interpersonal relationships.
- Every system has its **governance** and because most of the systems are **hierarchical**, rules of other systems may be subjected in the system's governance.
- Let's look at **the Internet** as an example
 - It is a system that follows specific regulations and rules which imply on how information is transmitted
 - At the same time every participant in the network is subject to international and local laws
 - These come in many forms and can include laws that pertain to privacy, data storage and anti-money laundering, etc.
- Governance, formal or informal, is everywhere.

Governance in **Traditional Finance**

- In **traditional financial markets**, owning a stock of a company means the holder owns a **piece** of the underling organization.
- Stocks usually come with claims on the company's profits, as well as governance power in the form of **voting rights**.
 - Voting rights can be exercised in several ways.
 - Shareholders may vote to elect members to the board of directors, approve the further issuance of stock, decide on dividend distribution, etc.
- When a company goes public, it distributes ownership and governance power to many parties.
- In many cases, large amounts of shares are owned by only a few, such as founders, early investors or early partners – the majority holders also possess the majority vote on governance.
- Otherwise, the company's governance structure can be considered, in a way, as decentralized (split among large numbers of small-scale voters).
- **Similar centralized and decentralized governance structures can also be seen in DeFi.**
 - **In other words, it is not always the case that DeFi governance is decentralized.**

Historical example of a company's share



Governance in DeFi

- As we discussed in the previous weeks, decentralization of participation and governance is at the heart of blockchain protocols and many DeFi applications built on top of them.
- To achieve this, many DeFi projects issue **governance tokens** that aim to decentralize the governance of the underlying protocol.
- **Governance tokens** can be:
 - **Earned**, by participating in certain activities, such as providing liquidity (think back to week 4).
 - **Minted**, for protocol creators and early investors.
 - **Gifted**, to addresses that fulfil specific criteria in a process known as an **airdrop**.
 - **Bought and sold**, in DEXes and CEXes, as with any other publicly traded token.
- Governance tokens are not to be confused with **utility tokens**, which can be exchanged for specific services.
- Governance token holders collectively decide on the future of a DeFi project by coming together under structures known as **Decentralized Autonomous Organizations (DAOs)**

Why is DeFi governance necessary?

There are two reasons why governance in DeFi is “necessary”.

1. It puts the “Decentralization” in DeFi
2. It is a necessary consequence of how value is managed by applications deployed on higher DeFi stack layers

In the words of Vitalik Buterin:

*“for application-layer projects, and especially DeFi projects, **we run into the problem that application-layer smart contract systems often directly control external assets**, and that control cannot be forked away.*

*If Tezos's on-chain governance gets captured by an attacker, **the community can hard-fork away without any losses** beyond (admittedly high) coordination costs.*

*If MakerDAO's on-chain governance gets captured by an attacker, **the community can absolutely spin up a new MakerDAO, but they lose all the ETH** and other assets that are stuck in the existing MakerDAO CDPs.*

*Hence, while off-chain governance is good for base layers and some application-layer projects, **many application-layer projects, particularly DeFi, will inevitably require formalized on-chain governance**”*

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2. Decentralized Autonomous Organizations (DAOs)

An Introduction to DAOs

Bitcoin gave birth to the notion of **unstoppable money** and **Ethereum** to the notion of **unstoppable code**.

DAOs are **unstoppable money + unstoppable code put together to create unstoppable organizations**.

To get a basic understanding of what a DAO is, let's examine the acronym. DAOs are:

- **Decentralized:** They do not possess a physical address and may not be directly subject (at least not yet) to the established rules and procedures regarding corporations. Instead, they are entirely incorporated online, and live on the blockchain, upheld by the nodes that help maintain the network.
- **Autonomous:** They are completely defined by self-executing code (smart contracts) and operate under the principle of “code is law”, within the limitations of the Layer 1 infrastructure that they are deployed upon.
- **Organization:** Meaning a collection of entities that come together to fulfill a common goal.
 - DAOs are agnostic to who or what interacts with the network and to the reasons they send or receive information or value. All they care about is receiving and sending valid information, as defined by the rules of consensus.
 - This means that blockchains, and by extensions DAOs can interact with humans, AI, or anything that can send and receive valid information.
 - As Richard Gendal Brown put it: On the blockchain nobody knows you are a fridge

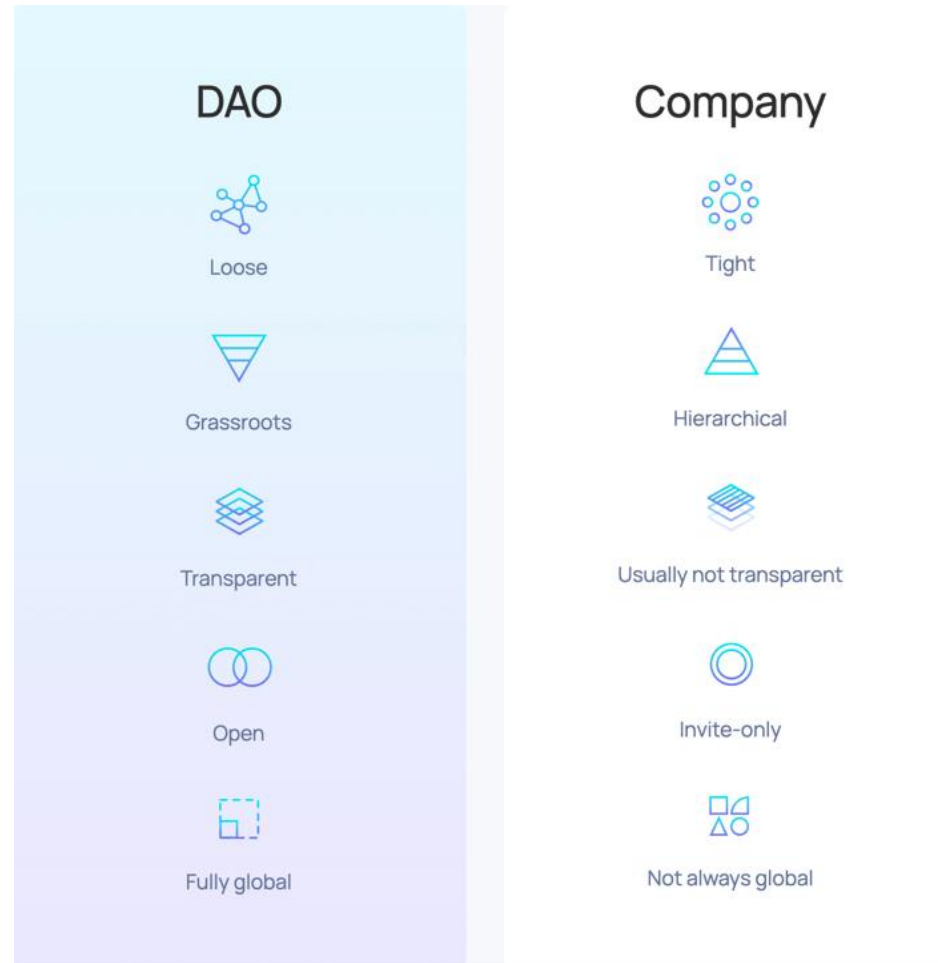
An Introduction to DAOs (continued)

- As systems deployed on higher layers of the DeFi stack, they can be programmed with specific goals and characteristics in mind.
- Some argue that DAOs are not directly comparable to traditional organizations that are built to optimize for profit, often times at the expense of the collective benefit, producing severe externalities and operating at the expense of inclusion, sustainability, resilience.
 - For example, they can inherit many of the properties of their underlying blockchain networks and thus be permissionless, decentralized, trustless, transparent, censorship resistant – **or not**
- Others argue that an ideal DAO would be **value-driven**, governed entirely by its individual members who democratically make decisions about the future of the project.
 - In reality, as with regular organizations, **DAOs are neither perfectly decentralized or centralized, nor perfectly “good” or “evil”**. They are influenced by the choices of their members and the environment they operate in.

Governance through DAOs

- DAO governance models present many similarities with traditional corporate governance.
- Governance token holders can:
 - **Create governance proposals** about the future of the protocol
 - **Vote** on proposals
- Proposals that reach some level of consensus (as defined in the smart contracts) are accepted and enforced.
- However, as we will demonstrate in the following slides, DAOs go beyond governance.

DAOs vs traditional organizations (another example)

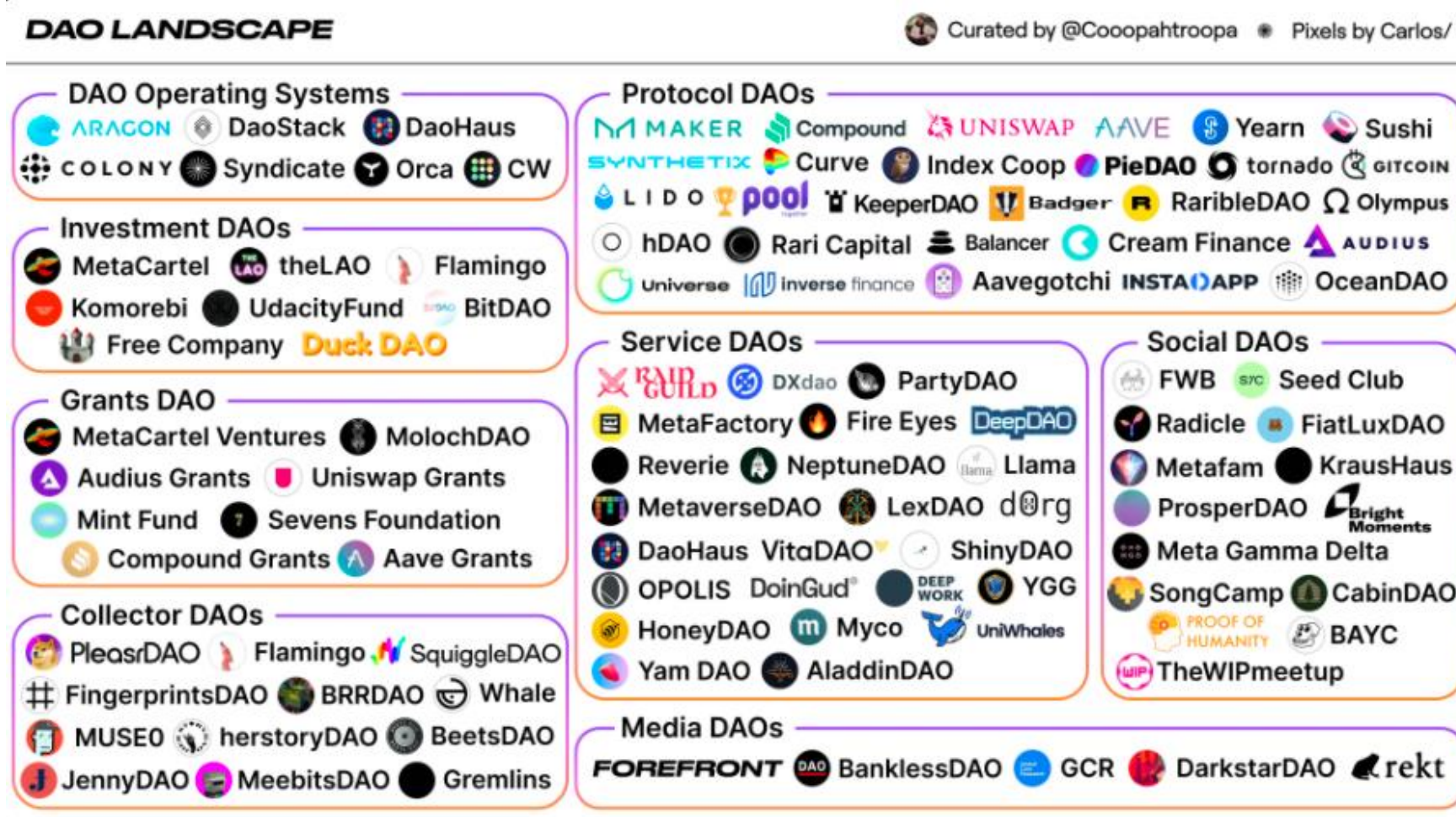


Source: Aragon

DAOs vs traditional organizations

Feature	DAO	Traditional Organizations
Organization	Flat and fully democratized (ideally)	Hierarchical (usually)
Decision Making	Voting necessary for change, transparent	Usually top management, non-transparent
Services	Executed programmatically exactly as described	Rely on humans and thus susceptible to human error or arbitrary behavior
Openness	No barriers to entry	Access must be granted by federation
Execution/Transparency	Public and verifiable	Predominately private, only in certain cases public (publicly traded companies)

DAOs come in many forms



Governance of popular DeFi applications (1/3)

- **Uniswap**



Its DAO governance model includes the proposal and vote system for its governance token. In order for users to submit a proposal for the platform, it is required that they own at least 1% of the total issued governance token UNI.

- **Compound**



Users can transfer their governance tokens (COMP) to others users to vote (Governance-as-a-Service). Compound also enforces a minimum 1% stake to submit a proposal.

- **Aave**



The governance token AAVE (and stkAAVE) provides its holders with proposal and voting power.

Governance of popular DeFi applications (2/3)

- **MakerDAO**



Participants interested in voting must lock-up their MKR (Maker DAO's governance token) by transferring them from their private wallets to the voting contract, from where they can be withdrawn at any time.

- **Curve**



The Curve DAO also uses proposal/voting methods to upgrade the protocol. For different lengths of time (minimum one week; maximum four years) CRV holders can lock their tokens so they can obtain vote escrowed CRV (veCRV) to gain voting and proposal power. There is no voting power minimum, but a user must have 2,500 veCRV to create a proposal.

- **Synthetix**



Although the core of the organization is formed by five different DAOs, it is not issuing a governance token. The SNX token is used as collateral for minting synthetics, but not for governance. Proposed improvements can be issued by anyone. Yet, approval only comes from the Spartan Council which consists of eight annually elected individuals that review proposals, interview proposal authors and implement approved proposals.

Governance of popular DeFi applications (3/3)

- **Yearn Finance**



Version 2 of Yearn Finance's governance, launched in April 2021, contains a multi-DAO structure that is managed by constrained delegation. The multi-DAO structure refers to groups (sub-DAOs) consisting of YFI holders that collectively form the governance of the protocol.

- **Rarible (NFTs)**



The governance model is also vote-based. RARI is earned by active participation in the platform, while holders can vote or submit proposals.

Overview of governance of select DeFi protocols

Protocol	Service	Governance Model	Who Can Vote	Who Can Propose
Uniswap	DEX	Voting	UNI Token Holders	Holders of > 1% total UNI supply
Compound	Lending/Borrowing	Voting	COMP Token Holders	Holders of >1% total COMP supply
AAVE	Lending/Borrowing	Voting	AAVE/stkAAVE Token Owners	AAVE/stkAAVE Token Owners
Maker DAO	Stablecoins	Voting	MKR Token Holders	MKR Token Holders
Curve	DEX	Voting	veCRV Token Holders	Holders with >2500 veCRV
Synthetix	Derivatives	Council	Spartan Council	Anyone
Yearn Finance	Yielding	Voting	YFI Token Holders	YFI Token Holders
Rarible	NFTs	Voting	RARI Token Holders	RARI Token Holders

DAOs beyond governance

There are many uses of DAOs, beyond DeFi governance, of course. After all, DAOs were not invented for DeFi.

For instance, many are starting to realize the benefits that come with working for flexible, internet-native organizations.

DAOs utilize a plethora of tools and mechanisms to compensate and reward, not only core, but also occasional contributors. These may include:

- Full employment, like in a traditional business.
[The example of Sushiswap](#)
- Grants for specific projects
[Unigrants initiative by Uniswap](#)
- Bounties for uncovering bugs/vulnerabilities and exploits
[AAVE](#)
- Other revenue sharing through peer assessment programs



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3. Governance token distribution in DeFi

Governance Decentralization in DeFi

- Governance models are important for protecting, developing, promoting, expanding and sustaining a DAO.
 - The more decentralized the participants who validate the decisions are the more **trust** exists in the organization.
- Most of the DeFi DAOs promote **governance decentralization** by **giving power** to users and community supporters.
 - It is, however, important to study the decentralization effectiveness of the proposed models and the reality of current DeFi governance.
- The majority of the protocols, that were discussed in the previous part (with the exception of Synthetix) rely on **token-backed governance models**
 - The more tokens an individual owns, the more voting and proposing power they hold.
 - In the following slides we investigate the distribution of governance power of different protocols to see how decentralized they really are (at least at the moment of writing this).
- Studying the level of decentralization of DeFi protocols is very challenging for a plethora of factors:
 - Vesting/lockup periods: funds are held in smart contracts for various reasons (future rewards incentives)
 - Pseudonymous nature of addresses: multiple addresses can be ultimately controlled by the same individual/group

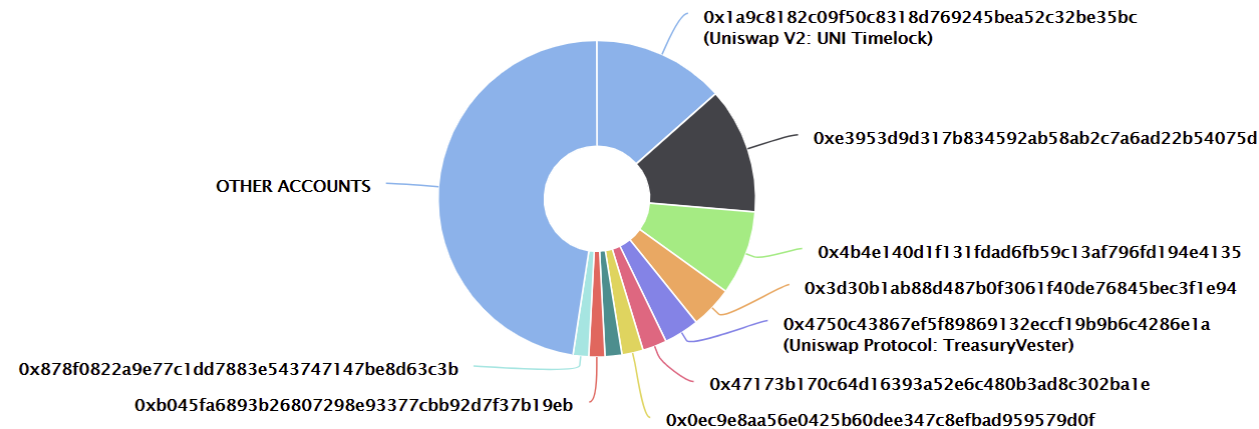
Governance token distribution - Uniswap

- 45.6% of UNI (governance token of Uniswap) supply belongs to the top-5 **smart contracts** (not private addresses)
- 10 private addresses hold 7.85% of UNI
- Only a subset of UNI holders can submit proposals
- Yet the vast majority of UNI is held by “other addresses”
- What does this tell us about the degree of decentralization of Uniswap (or any other protocol)?
 - Not much
 - We also need to take into account other factors, including off-chain forms of governance
 - Discussions in the forums/twitter/discord
 - Which of those addresses are owned by exchanges?
 - What is the policy of exchanges when it comes to voting?
 - etc

Source: <https://etherscan.io/>

Uniswap Top 10 Token Holders

Source: Etherscan.io



- ### Aave Token Top 25 Token Holders
- Source: Etherscan.io
-
- | Address | Holder Name |
|--|-----------------------------|
| 0x4da27a545c0c5b758a6ba100e3a049001de870f5 | Aave: Staked Aave |
| 0x25f2226b597e8f9514b3f68f00f494cf4f286491 | |
| 0xffc97d72e13e01096502cb8eb52dee56f74dad7b | Aave: aAAVE Token V2 |
| 0xc697051d1c6296c24ae3bcef39aca743861d9a81 | |
| 0xf977814e90da44bfa03b6295a0616a897441acec | Binance 8 |
| 0x317625234562b1526ea2fac4030ea499c5291de4 | Aave: LEND To AAVE Migrator |
| 0xbe0eb53f46cd790cd13851d5eff43d12404d33e8 | Binance 7 |
| OTHER ACCOUNTS | |

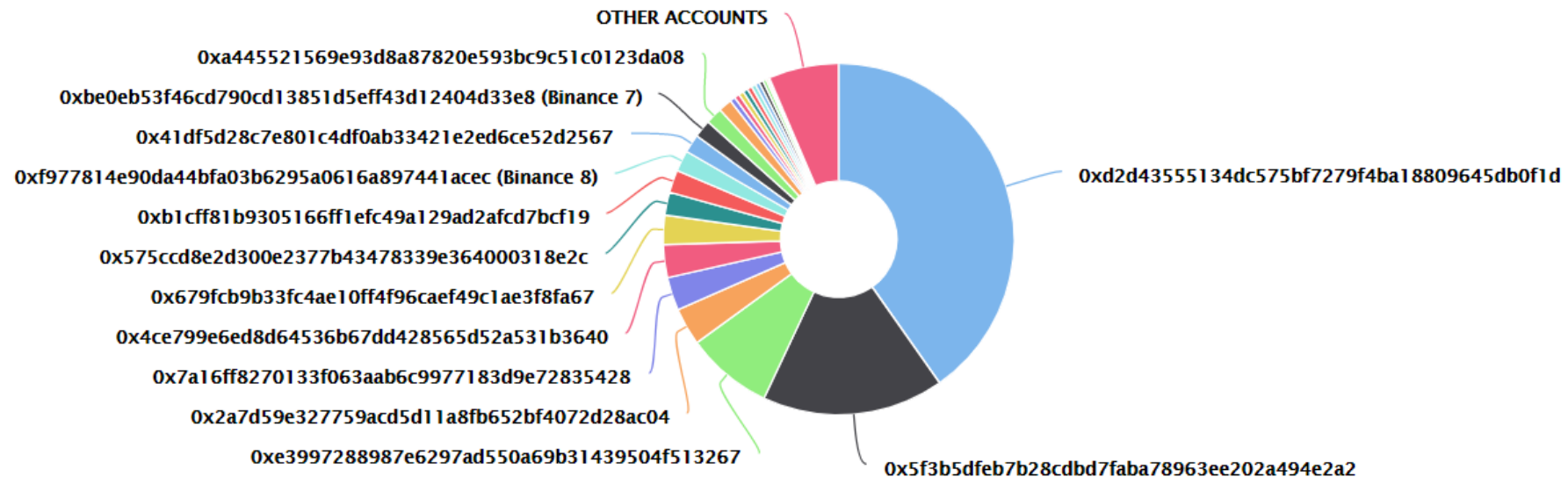
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Governance token distribution - Curve

- According to Etherscan, 75.2% of the total token supply is stored in smart contracts, and 13.04% owned by the top-10 addresses.

Curve DAO Token Top 25 Token Holders

Source: Etherscan.io



Source: <https://etherscan.io/>

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4. Beyond token governance

Issues with token governance (1/3)

The following are some examples of problems with token-based governance:

- **Plutocracy:** DeFi protocols whose governance tokens are concentrated in the hands of few are effectively run by a plutocracy, not by the wider community. While there is an argument to be made that large token holders have vested interest in making decisions that will benefit the network to maximize their wealth, it still remains a less-than-ideal approach to truly decentralized governance.
- **Apathy:** As small token holders have, individually, negligible impact in shaping the governance of a protocol, they tend to have little incentive to vote. By not voting, small token holders essentially delegate their authority and further empower the already established plutocracy.
- **Coin holders above all:** While DeFi protocols do not exist in isolation and need to fulfill the needs of diverse stakeholders, token voting governance only allows token-holders to have a say on the future of the protocol. Token holders are incentivised to satisfy their own interests, even at the expense of the wider community.

Source: <https://vitalik.ca/general/2021/08/16/voting3.html>

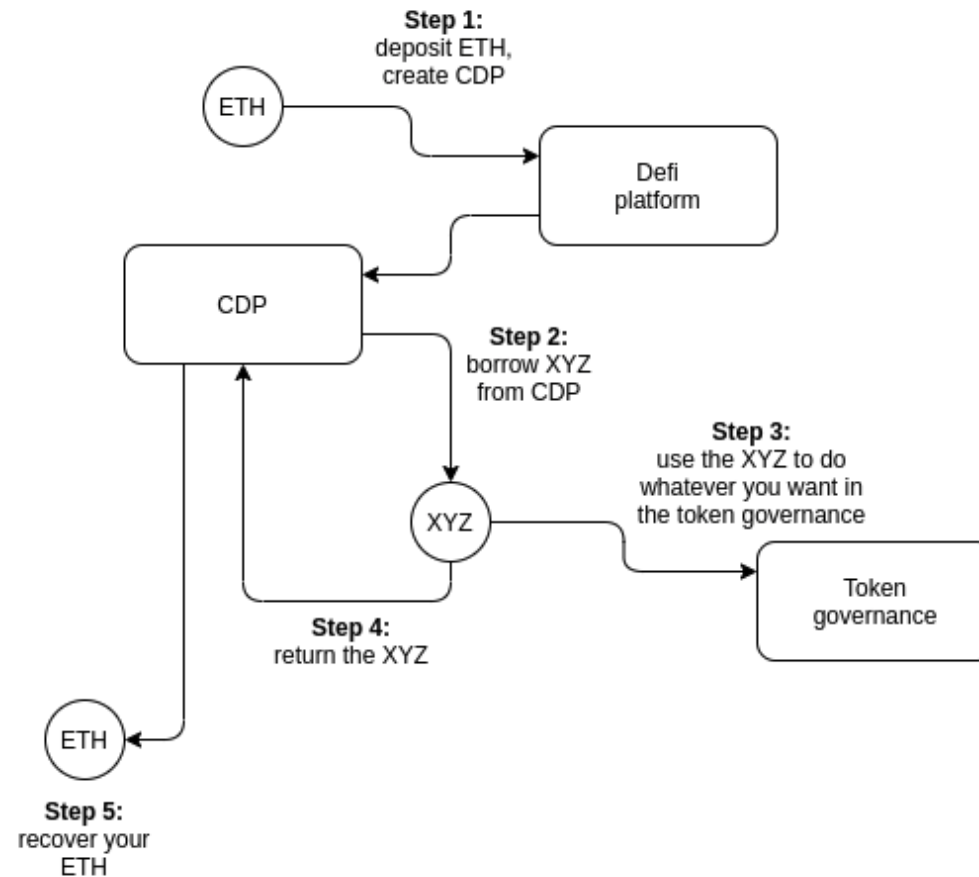
Issues with token voting governance (2/3)

In some cases, due to the nature of governance tokens, there is also significant misalignment of incentives:

- Consider the example of User A who provides liquidity in governance token XYZ in a DeFi lending protocol.
- Malicious User B takes out loans in XYZ by posting Ether as collateral. They then use their XYZ voting power to submit and/or vote for proposals that benefit them, while harming other holders.
- As a result, the value of XYZ decreases. User B pays back the devalued XYZ and releases their collateral.
- In this scenario, User A, has an economic interest but no governance power, while User B has governance power without legitimate economic interest.
- That is true because governance tokens in most cases **represent 3 things at once**:
 - The right to participate in governance
 - Some share in the revenue of the protocol
 - The appreciation of the token itself
- While this is a deliberate attempt at aligning **power** and **responsibility**, it also comes with consequences.

Source: <https://vitalik.ca/general/2021/08/16/voting3.html>

Issues with token voting governance (3/3)



Source: <https://vitalik.ca/general/2021/08/16/voting3.html>

Mitigating the issues of token governance

Various techniques have been proposed for mitigating some of these problems.

- **Delegation:** where small token holders delegate their voting power to other users; however, this may further empower established plutocracy.
- **Limits in governance:** In terms of parameters and choices, time delays and locks, as well as making fork coordination and execution easier.
- **Non-token governance:** In such systems, each (human) user would have an equal voting power. Taking this concept a step further, proof of humanity, can be coupled with proof of participation, or even proof of contribution, if narrowing down voting right distribution is deemed necessary.
- **Accountability:** Making individual voters accountable for the consequences of their actions by imposing individual penalties and rewards based on the outcome.

Source: <https://vitalik.ca/general/2021/08/16/voting3.html>

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5. Conclusions

Conclusions

In this session we discussed what governance is in the context of traditional, and blockchain-backed organizations. You should now have an understanding of how decentralized applications approach governance, and how it differs from governance in traditional deployments.

Following our introduction to DAOs, you should have a basic understanding of the governance schemes utilized by popular DeFi applications.

Through on-chain analysis, we examined the level of decentralization in some popular DeFi applications and provided you with actual data on the types of stakeholders responsible for many of the decisions in DeFi.

Finally, we have discussed the multifaceted shortcomings of token-based governance and provided some insight into how those can be mitigated by employing specific mechanisms.

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6. Further Reading

Further Reading

- DAOs
 - [Governance in a Decentralized Autonomous Organization](#)
 - [Decentralized Autonomous Organizations](#)
 - [A beginner's guide to DAOs](#)
 - [Understanding the DAO Attack](#)
- Governance:
 - [Positive Sum Worlds: Remaking Public Goods](#)
 - [Coordination, Good and Bad](#)
 - [On Collusion](#)
 - [Governance, Part 2: Plutocracy Is Still Bad](#)
 - [Notes on Blockchain Governance](#)
 - [Decentralized governance in DeFi: Examples and pitfalls.](#)

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