

Tokenomics & Mechanism Design: A Visual Introduction

Standalone Mini-Lecture

"Tokenomics is where economics meets cryptography – design the incentives, and the system runs itself" – Vitalik Buterin

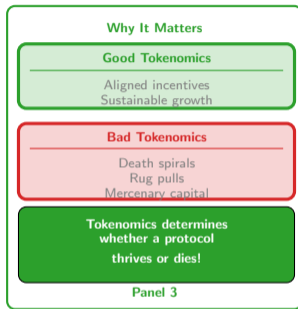
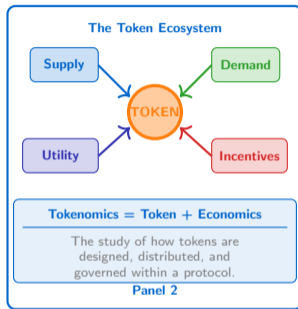
Prof. Dr. Joerg Osterrieder

University Lecture Series

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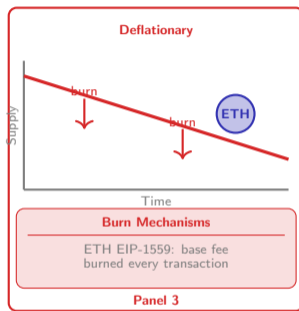
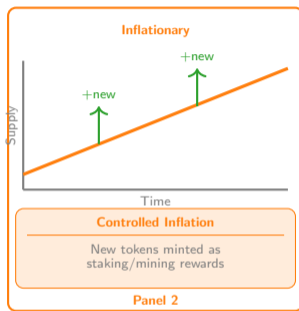
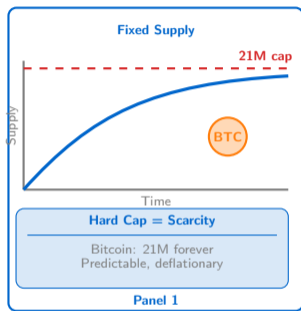
This mini-lecture covers tokenomics fundamentals: supply models, utility types, bonding curves, incentive design, token distribution, vesting schedules, and real-world case studies.

What is Tokenomics?



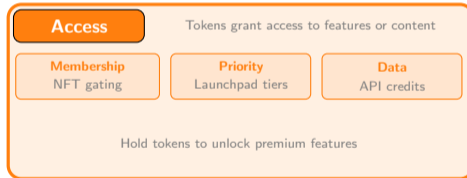
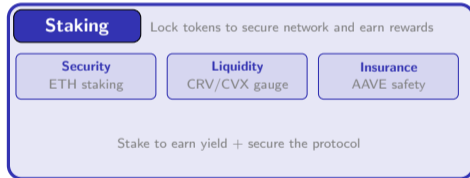
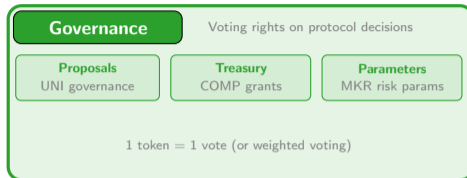
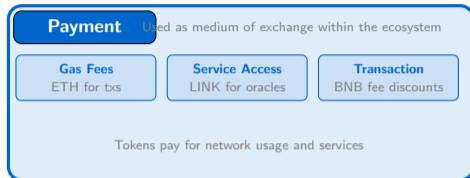
Tokenomics is the economic design of a crypto token: its supply, demand, utility, and incentive structures. Good tokenomics aligns participant behavior; bad tokenomics leads to death spirals and value collapse.

Token Supply Models



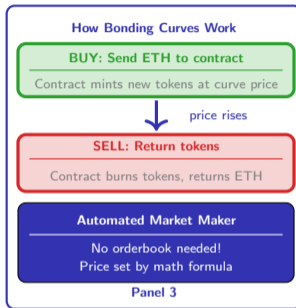
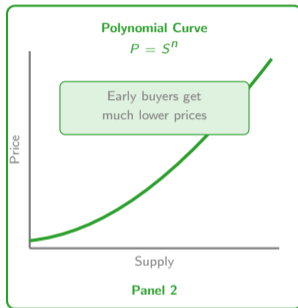
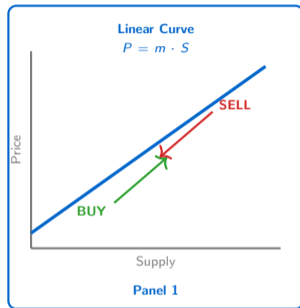
Three supply models: Fixed (Bitcoin's 21M cap creates digital scarcity), Inflationary (new tokens minted as rewards, diluting holders), Deflationary (tokens burned, reducing supply over time like ETH post-EIP-1559).

Token Utility Types

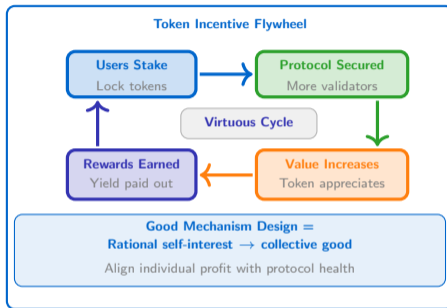
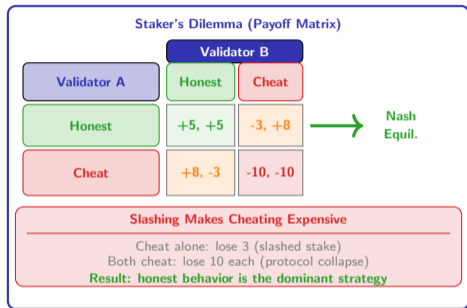


Four main token utility types: **Payment** (gas fees, services), **Governance** (voting on proposals, parameters, treasury), **Staking** (lock tokens for security and yield), **Access** (gate content, priority, or features).

Bonding Curves Visualized

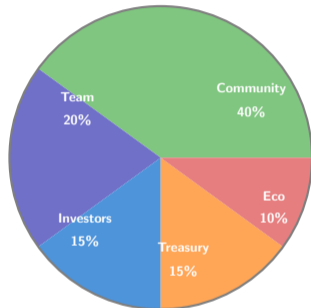


Bonding curves are mathematical functions that set token price based on supply. Buy = mint tokens (price increases). Sell = burn tokens (price decreases). No orderbook – the smart contract IS the market maker.



Good tokenomics uses game theory: slashing makes dishonesty unprofitable (Nash equilibrium favors honest behavior). The incentive flywheel creates a virtuous cycle: stake → secure → value up → rewards → more staking.

Typical Token Distribution

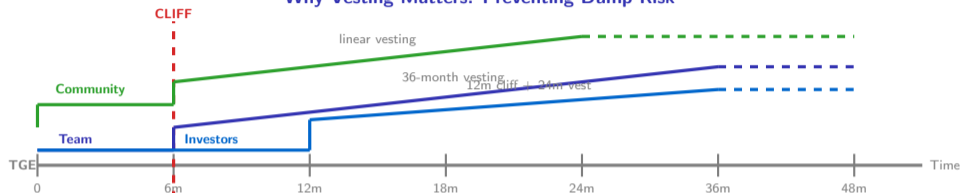


Distribution Methods

Fair Launch	No pre-mine, no investor allocation Example: Bitcoin, YFI
ICO / IDO	Token sale to raise funding Example: Ethereum, Polkadot
Airdrop	Free tokens to early users Example: UNI, ENS, Arbitrum
Liq. Mining	Earn tokens by providing liquidity Example: COMP, SUSHI

Token distribution determines who holds tokens and when. Typical split: 40% community, 20% team, 15% investors, 15% treasury, 10% ecosystem. Methods: fair launch (no pre-mine), ICO/IDO (sale), airdrop (free to users), liquidity mining.

Why Vesting Matters: Preventing Dump Risk



Without Vesting

Team dumps at launch
Price crashes 80%+
Community loses trust

With Vesting

Gradual token release
Team incentivized long-term
Price stability improved

Key Terms

TGE = Token Generation Event
Cliff = lock-up before any release
Linear vesting = steady unlock

Vesting schedules prevent insiders from dumping tokens at launch. Typical: 6–12 month cliff (no tokens released), then 24–48 month linear vesting. Community tokens often have shorter or no cliff; team/investor tokens have longer lock-ups.

UNI (Uniswap)

Pure Governance Token

Supply: 1B fixed — No burn — Inflationary after 4yr
2% annual inflation starts after initial 4-year distribution

Utility:

Vote on governance proposals
Control treasury (\$3B+)
No fee sharing (yet)

Distribution:

60% community (airdrops + mining)
21.5% team (4yr vesting)
18% investors (4yr vesting)

Verdict: Governance-only design

Criticism: no value accrual to holders
“Fee switch” debate ongoing

MKR (MakerDAO)

Governance + Backstop Token

Supply: ~900K — Burns from fees — Mint on shortfall
Net deflationary: stability fees buy & burn MKR

Utility:

Vote on risk parameters
Backstop: minted if DAI undercollateralized
Fee accrual via buy & burn

Dual-Token Model:

DAI = stablecoin (\$1 peg)
MKR = governance + value capture
Synergy: DAI usage → fees → MKR burn

Verdict: Value-accruing design

Revenue directly reduces MKR supply
Risk: MKR dilution during liquidation events

UNI: pure governance token with no direct fee capture – “fee switch” remains controversial. MKR: governance + value accrual via buy-and-burn from stability fees, but carries backstop dilution risk. Two contrasting approaches to token design.

1

Supply model shapes value

Fixed value creates scarcity (BTC). Inflationary rewards participation.
Deflationary burns increase value for remaining holders.
Choose based on protocol goals.

2

Bonding curves automate price discovery

Mathematical price-supply relationship eliminates orderbooks.
Buy mints tokens (price up). Sell burns tokens (price down).

3

Incentive alignment is everything

Everything ensures honest behavior is profitable. Slashing punishes cheaters.
Vesting prevents insider dumps. Distribution must be fair.

4

Bad tokenomics kills projects

Death spirals, rug pulls, mercenary capital.

5

Design for alignment

UNI vs MKR: different but valid models.

Coming Next: Dive into bonding curve math, vesting contracts, and token design frameworks

From theory to Solidity: implementing tokenomics on-chain

Tokenomics is the foundation of every crypto project. Supply models, bonding curves, incentive alignment, fair distribution, and proper vesting separate sustainable protocols from speculative bubbles.