FACULTY OF AUTOMATIC CONTROL AND COMPUTERS

POLITEHNICA BUCUREȘTI 1818

Sessions 10
Tokens, NFT, Tokenomics

Blockchain Protocols and Decentralized Applications

Objectives

- Cryptocurrency
- Fungible Tokens
- Non Fungible Tokens
- Tokenomics

Cryptocurrencies

- Total market cap: 3.46T $
- Bitcoin - 1.89T $
- Over 15.000 tokens* tracked
- 20% of U.S. adults have invested in or traded cryptocurrencies
- NFTs - 11B $
- **What do you think gives value to cryptocurrencies and tokens?**

* fungible

Fungible Tokens

- Interchangeable assets (1 ETH = 1 ETH)
- Native or non-native
- Native: ETH, EGLD, SOL
  - Used to pay gas for blockchain usaged
- Non-native:
  - ERC-20: USDT, WETH
  - ESDT: MEX, WEGLD
  - SPL: USDC, USDT, BONK, RAY, SRM
- Use cases
  - Stablecoins - simulate fiat money
  - Governance
  - Utility tokens
- Demo (explorer)

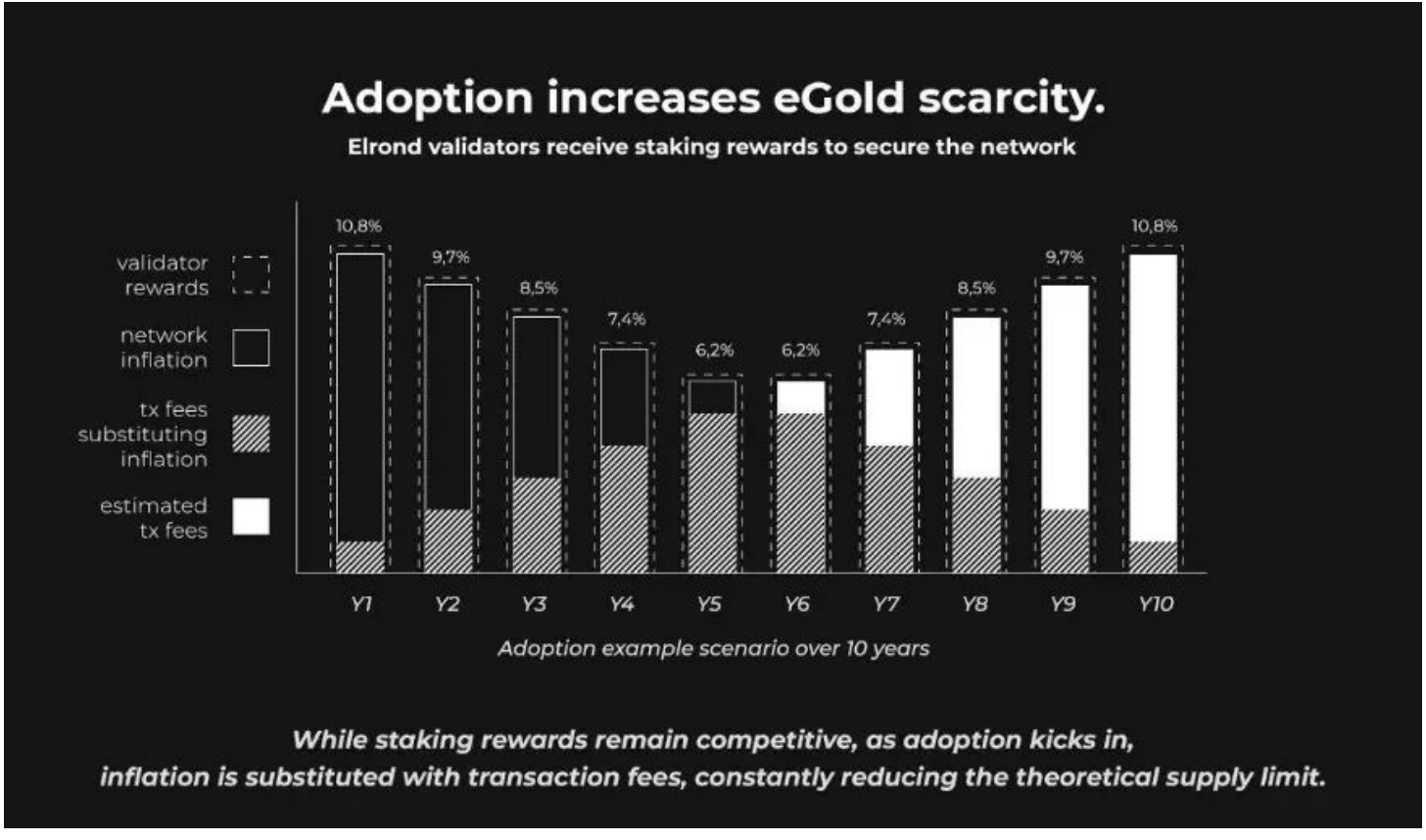
Non Fungible Tokens

- Unique assets
- Implementation
  - Ethereum: ERC-721/ERC-1155
  - MultiversX: ESDTs
  - Solana: SPLs
- Use cases
  - Digital art
  - Gaming assets
  - Certificates
  - Real estate
- Demo (NFT Marketplace)
- Brainstorming

Tokenomics

- Token + economics
- Supply
  - Fixed supply: Bitcoin 21M cap, MultiversX 31.42M EGLD;
  - Infinite supply: DOGE, Ethereum, Solana;
- Inflationary
  - Dogecoin (DOGE) - 5B tokens minted annually;
  - Ethereum - EIP-1559 introduced burn mechanism - deflationary during high network activity;
  - MultiversX (EGLD) - case study on next slide
  - Solana (SOL)
- Deflationary
  - Bitcoin?
  - Binance Coin (BNB)
  - Shiba Inu (SHIB)

Case Study - MultiversX



Tokenomics

- Utility
  - Access, rewards, governance
- Incentives
  - Staking Providers
- Distribution
  - ICO - initial coin offering
  - Airdrops
- Governance
  - Decentralized decision making based on token ownership

Comparison BTC-ETH-MvX-SOL

Aspect	BTC	ETH	EGLD	SOL
Supply cap.	21 million	No cap, burn mechanism	31.4 million	No hard cap, declining inflation
Inflation	Deflationary via halving	Semi-deflationary via burns	Inflationary through staking rewards	Inflationary → disinflationary (≈1.5% long-term)
Utility	Payments, store of value	Gas fees, DeFi, dApps	Gas fees, staking, DeFi	Gas fees, staking, DeFi, NFTs, MEV
Consensus	Proof of Work	Proof of Stake	Secure Proof of Stake	Proof of Stake + Proof of History
Token incentives	Mining rewards	Validator rewards	Staking rewards	Validator & delegator rewards

Bitcoin (BTC)

- Supply Dynamics:
  - Fixed supply cap of 21 million BTC. No more BTC will ever be created once this cap is reached.
  - Block reward halving occurs approximately every 4 years, reducing new BTC issuance by 50%.
  - Estimated final BTC will be mined in the year 2140.
- Utility:
  - Primarily a store of value ("digital gold").
  - Used for peer-to-peer payments.
- Incentives:
  - Mining rewards decrease over time, encouraging long-term price appreciation due to scarcity.
  - Security is incentivized through transaction fees as block rewards diminish.
- Distribution:
  - Early adopters and miners accumulated significant BTC; however, mining has become centralized due to the need for specialized hardware.
- Challenges:
  - Lack of programmability limits its use cases beyond payments and store of value.
  - Environmental concerns due to Proof of Work mining.

Ethereum (ETH)

- Supply Dynamics:
  - Initially had an uncapped supply, but with the introduction of EIP-1559, Ethereum implemented a burn mechanism that removes a portion of transaction fees from circulation.
  - The move to Proof of Stake (PoS) has significantly reduced new ETH issuance (approximately 0.43% inflation rate annually under current conditions).
  - Network activity directly influences whether ETH behaves inflationary or deflationary.
- Utility:
  - Native token for gas fees on the Ethereum blockchain.
  - Powers smart contracts, decentralized applications (dApps), and DeFi ecosystems.
- Incentives:
  - Validators earn rewards for securing the network in PoS.
  - Burn mechanism aligns user activity with token scarcity, potentially increasing value.
- Distribution:
  - Initial distribution through an ICO in 2014.
  - Ongoing rewards to validators in PoS.
- Challenges:
  - High transaction fees during network congestion.
  - Intense competition from newer Layer 1 blockchains offering scalability.

MultiversX (EGLD)

- Supply Dynamics:
  - Fixed maximum supply of 31.4 million EGLD.
  - Supply decreases over time; in 10 years, no inflation.
- Utility:
  - Used to pay for transaction fees on the MultiversX blockchain.
  - Staking rewards for network validators and delegators.
  - Acts as the base currency for ecosystem dApps, DeFi protocols, and NFT marketplaces.
- Incentives:
  - Staking and delegation reward mechanisms ensure decentralization.
- Distribution:
  - Started with a token swap (from ERD to EGLD) and an initial supply allocation to early investors, staking rewards, and ecosystem incentives.
- Challenges:
  - Competes in a saturated market against Ethereum and other Layer 1 blockchains.
  - Ecosystem growth is key to sustaining value.

Solana (SOL)

- Supply Dynamics:
  - No fixed maximum supply; inflationary with a declining issuance schedule.
  - Inflation decreases over time toward a long-term rate of ~1.5% annually, with partial fee burning offsetting issuance.
- Utility:
  - Used to pay for transaction fees on the Solana blockchain.
  - Staking rewards for validators and delegators.
  - Base currency for ecosystem dApps, DeFi protocols, NFT marketplaces, and on-chain games.
- Incentives:
  - Validator and delegator rewards secure the network and encourage decentralization.
  - Fee-based incentives and MEV opportunities support high-performance validators.
- Distribution:
  - Initial token distribution included foundation allocation, early contributors, investors, and ecosystem incentives.
  - Ongoing issuance primarily rewards validators and stakers.
- Challenges:
  - No hard supply cap may be perceived as less attractive to store-of-value narratives.
  - Network reliability and validator decentralization remain critical as adoption scales.

Token Value

- 1 UTK = 0.048$
- How can we provide a price to a token?
- Demo
  - DEX
  - Create a token
  - Give it a value in USD