



OST

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Blockchain (BlCh)

Stablecoins

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Learning Goals

- Lecture 12
 - Explain why stablecoins exist
 - Compare collateralization types
 - Understand overcollateralization requirements for crypto-backed stablecoins
 - Profitability model of stablecoin issuers

Introduction to Stablecoins

- “Stablecoins are cryptocurrencies where the price is designed to be pegged to a reference asset.” [\[link\]](#)
- Collateralization: how to back the stablecoin
 - Fiat money (USD, EUR)
 - Asset-backed (e.g., gold)
 - Crypto-Collateralized
 - Crypto asset backed stablecoins (decentralization)
 - Algorithmic stablecoins (probably don’t work)
- Reasons for stablecoins
 - Cryptocurrencies have high volatility
 - Payment in “real world” still with fiat
- From a technical perspective, stablecoins are mostly smart contract tokens, not native currencies
- Top Stablecoins [\[link\]](#)

Name	Chains	% Off Peg	1m % Off Peg	Price	1d Change	7d Change	1m Change	Market Cap
1 Tether (USDT)		-0.01%	-0.11%	\$1	+0.01%	+0.43%	+0.73%	\$184.49b
2 USD Coin (USDC)		-0.02%	-0.04%	\$1	+0.61%	+0.53%	-1.42%	\$74.749b
3 Ethena USDe (USDe)		-0.08%	-0.19%	\$1	-0.94%	-6.64%	-29.62%	\$7.292b
4 Sky Dollar (USDS)		-0.03%	-0.15%	\$1	+2.01%	+1.17%	+9.11%	\$5.799b
5 Dai (DAI)		-0.02%	-0.17%	\$1	+0.31%	-1.75%	-6.95%	\$4.771b
6 PayPal USD (PYUSD)		-0.01%	-0.06%	\$1	+0.86%	+6.79%	+35.46%	\$3.758b
7 World Liberty Financial...		-0.10%	-0.15%	\$1	+0.60%	-2.04%	-8.41%	\$2.728b
8 Falcon USD (USDF)		-0.26%	-0.51%	\$1	+0.01%	+1.10%	-0.86%	\$2.08b
9 BlackRock USD (BUIDL)		0%	0%	\$1	-15.88%	-15.93%	-32.82%	\$1.806b
10 Ethena USDtb (USDTB)		+0.04%	+0.51%	\$1	+0.03%	+0.36%	-26.86%	\$1.338b

History of Stablecoins

- Early Days of Stablecoins (2014-2017)
 - 2014: Tether (USDT) launched as first major stablecoin, 1:1 peg to the US dollar
 - 2015-2017: USDT gains traction, offering traders a “safe harbor” from volatility
- Growth and Evolution (2018-2019)
 - 2017-2018: USDT raises questions about transparency and reserve audits
 - 2018: MakerDAO launches DAI, first major decentralized, crypto-collateralized stablecoin. DAI gains popularity in the DeFi space
 - 2019: Facebook announces Libra, global stablecoin backed by basket of fiat currencies.
- Stablecoins in DeFi and Algorithmic Experiments (2020-2021)
 - 2020: Stablecoins gain popularity due to DeFi. USDC, DAI, BUSD gain significant market share
 - 2021: UST emerges as prominent algorithmic stablecoin. Rapid adoption but collapses in 2022 → major crisis in crypto market
- Recent Developments (2022-Present)
 - 2022: Collapse of UST shows risks of algorithmic stablecoins
 - 2023: Increased regulatory pressure from global entities, EU and U.S. (e.g., [MiCA](#), [U.S. Treasury](#)) → improve transparency and compliance

Stablecoins Gone Wrong (1/2)

- Successful: USDT/USDC/Sky,DAI
- Epic fail: [Terra/UST](#)
 - Algorithmic nature of UST
 - Seignorage-Style stablecoin [\[link\]](#)
 - [Anchor Protocol](#) and High-Yield Returns
 - The Depegging
 - Loss of confidence
 - Market volatility
 - Mass withdrawals from Anchor
 - Death spiral
- Impact and consequences
 - Complete collapse of UST and LUNA
 - TerraUSD and Luna wiped ~\$45 billion market capitalization
 - Regulatory scrutiny
- Lessons from Terra UST's collapse
 - Algorithmic models can be highly unstable
 - Sustainability of high yields
 - Regulatory gaps
- Co-founder and CEO: [Do Kwon](#)
 - Arrested on 23 March 2023, in US custody
- Algorithmic stablecoin problems [\[link\]](#)

Stablecoins Gone Wrong (1/2)

- Fail: [Binance](#) stopped BUSD
 - Collaboration with Paxos
 - [Paxos](#) ordered by the New York Department of Financial Services (NYDFS) to stop issuing BUSD
 - SEC threatened Paxos with legal action, claiming BUSD might be an unregistered security
 - Paxos / Binance halted BUSD, but without any loss of funds
- Role of [Changpeng Zhao](#)
- Fail: [Facebook/Libra/Diem](#)
 - Rise of L1 blockchains: Aptos und Sui
 - Common origins and shared codebase
 - Regulatory resistance and collapse of diem
 - Global opposition
 - International resistance
 - Outcome
 - Meta ultimately abandoned the Diem project
 - Continuation of Diem's Legacy
 - Aptos, Sui (mainnet), Linera (devnet)

Stablecoins in CeFi / DeFi

- Asset-backed: CeFi
 - Coinbase, Binance need to buy fiat assets
 - Example: 50 USDT issued → requires 50 USD in reserves
 - User buys 20 USDT → issuer mints 20 more (total 70 USD backing)
 - User redeems 30 USDT → issuer destroys tokens, releases 30 USD
 - Risk: If assets illiquid → bank-run, insufficient liquidity
- Crypto-backed: DeFi
 - [MakerDAO/Sky](#) uses crypto collateral
 - Launched 2017 with decentralization vision
 - Survived Black Thursday 2020 (\$8M loss) but shifted to centralized collateral dominance
 - Requires over-collateralization due to volatility
 - Example:
 - User deposits 2 ETH collateral (worth \$3,000)
 - System allows minting 1,000 DAI (150% ratio)
 - ETH drops to \$1,200 → ratio falls below minimum
 - Liquidation triggered → collateral auctioned
 - Sky collateralization ratio: 123% [[Sky stats](#)]

Stablecoins

- Why create stablecoins?
 - Protocol earns stability fees + liquidation penalties
 - Users get USD exposure without selling volatile assets
- Use cases:
 - Borrowing/Lending
 - Access USD liquidity without selling ETH
 - Use as collateral for other DeFi protocols
 - Yield farming (stablecoin rates often > ETH)
 - Requires maintaining collateralization ratio
 - Trading & Settlement
 - Quick exit from volatile positions
 - Cross-exchange arbitrage
- Collateral liquidation mechanism
 - Liquidation penalties (~10-15%) incentives
 - Risk: Cascade liquidations
- Peg Stability Module (PSM)
 - Some protocols allow direct swaps with other stablecoins
 - Trade-off: Better peg stability vs increased centralization risk
 - Dependence on external stablecoin issuers (USDC, USDT)
- Risks
 - Terra/UST collapse (algorithmic stablecoin failure)
 - Liquidation cascades during extreme volatility (see Black Thursday 2020)
 - Users bear liquidation risk in volatile markets
 - Liquidation requires significant capital + technical expertise