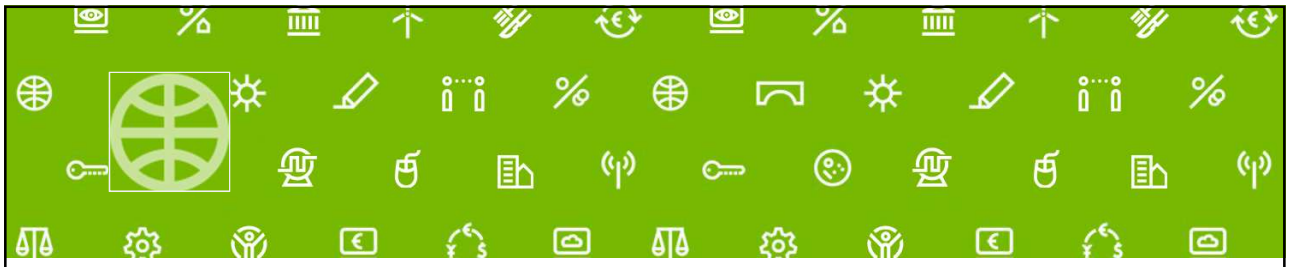

FMM Summer School 2024

Crypto assets and financial stability

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Based on Joebges/Herr/Kellermann (2024)

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Why this topic at a PK Summer School?

- Core to PK approaches: skepticism against decentralized self-regulating markets; need for complex stabilization policies
- "Money is essential in the short- and in the long-run" (=> Presentation E. Hein)
  - Monetary Production Economy implies that money and finance are intrinsically linked with real economy;
  - "environment consistent rational" investors have to deal with fundamental uncertainty, incomplete information, imperfect markets
- Financial crises can have long-lasting effects on the economy
- Financial systems require stabilizing and regulating institutions (CB as lender-of-last-resort, Financial system supervision & regulation, deposit insurance…)

Opposite view on money: Hayek (1976)

- Starting point: central banks' monopoly on the issuance of legal tender is source of inflation/ deflation bouts
- Suggestion: denationalize money
  - allow a system of competing private currencies
  - currency competition will force issuers of money to keep their currencies stable in terms of their purchasing power
  - private monies will outcompete national public monies
- Assumptions: Neoclassical dichotomy and money neutrality; stable real growth; rational agents, exogenous money creation; financially induced instability (by imperfect information of financial authorities, suboptimal political incentives, …)

Motivation for crypto assets close to Hayek (1976): Criticism of the traditional financial system

- Increased criticism against the traditional financial system since the financial crisis ("legitimacy crisis", Weber 2016)
- "**The root problem with conventional currency is all the trust that's required to make it work.** The central bank must be trusted not to debase the currency, but the history of fiat currencies is full of breaches of that trust. **Banks must be trusted** to hold our money and transfer it electronically, **but they lend it out in waves of credit bubbles with barely a fraction in reserve.** We have to trust them with our privacy, trust them not to let identity thieves drain our accounts." (*Nakamoto 2009, Bitcoin-creator, emphasis by HJ)*

Focus of this presentation: Crypto assets are no solution, but a threat to the financial system!

- **Crypto assets are no substitute for money**, as they do not fulfill money functions – neither Bitcoins nor Stablecoins nor other cryptos
- **Crypto assets are inherently instable**
- **Increasing usage will increase financial and macroeconomic instability**
- Developing countries with less trusted currencies will face additional pressure of a decreasing policy space, easier capital flight and tax erosion

Outline

- Motivation
- **Money and money stabilizing institutions**
- Classifications & examples of crypto assets
- Unbacked crypto assets like Bitcoin are not money
- Backed crypto assets like stablecoins are neither money
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- … and pose systemic risks to the real economy
- Conclusions

Excursion: What is money?

"Everyone can create money; the problem is to get it accepted"

Hyman P. Minsky (1986: 255)

Money = Cash + deposits (=Fiat money + credit money)

"…money … is anything that is generally accepted as payment for goods or services or in the repayment of debt."

Frederic S. Mishkin (2016: 95)

Excursion: Functions of money (e.g. Mishkin 2016: 96ff)

1. **Means of Payment**—promotes economic efficiency by minimizing the time spent in exchanging goods and services
   i. Must be easily standardized
   ii. Must be widely accepted
   iii. Must be divisible
   iv. Must be easy to carry
   v. Must not deteriorate quickly
2. **Store of Value**—used to save purchasing power; most liquid of all assets but loses value during inflation
3. **Unit of Account**—used to measure value in the economy

Excursion:
Fiat & credit money need stabilizing institutions

Institutions for securing its value and thereby acceptance

- Central bank as lender-of-last-resort
  (Bagehot 1873, Goodhart 1987, Freixas et al. 2000)
- Banking regulation & supervision for shielding the banking system from misbehavior of single banks
  (Miskin 2016: 266-274)
- Deposit insurance against bank runs
  (MacDonald 1996, Cull et al. 2005)

➢ **Central bank & state try to stabilize & guaranty value of money**

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Classifications of crypto assets I

- "At present, there is no universal definition of a 'crypto asset'" …
- "Similarly, to date there is no universally accepted classification of activities that incorporate crypto assets and smart-contract functionalities in the provision of financial services"

Source: Ocampo et al. (2023: 8)

Classifications of crypto assets II

- **Payment Tokens**
  - Crypto currencies (Bitcoin, Ethereum, …)
  - Stablecoins (Tether, USD Coin, DAI, …)
  - Central bank digital currencies (CBDCs)
- **Security Tokens** (Bonds, Real Estate, Gold, Art, Wine, Cars,…)
- **Utility Tokens** (access authorization, patents, licenses, voting rights…)

Token: information of the asset is saved on a blockchain

Classifications of crypto assets III
(BIS 2023)

1. **Unbacked crypto assets**
   - Bitcoin, Ethereum, …
2. **Backed crypto assets**
   - Stablecoins like Tether, USD Coin, DAI…
3. **Smart contracts & Decentralized Finance (DeFI)**
   - Financial services, other assets & liabilities, swaps, options, futures, with increasing complexity

Example of an unbacked crypto asset: Bitcoin

- System of electronic transactions
- … running without intermediaries or third parties
- … based on digital identities (Nakamoto 2008)
- Necessary: Digital „Wallet" and „Key"
- Individual digital „fingerprint" of each transaction („Hash function")
- … that is saved in a decentralized way via *distributed ledger technology** on all computers
- … visible for all interested, cannot be manipulated

**decentralized organisation of entitlement to writing and reading*

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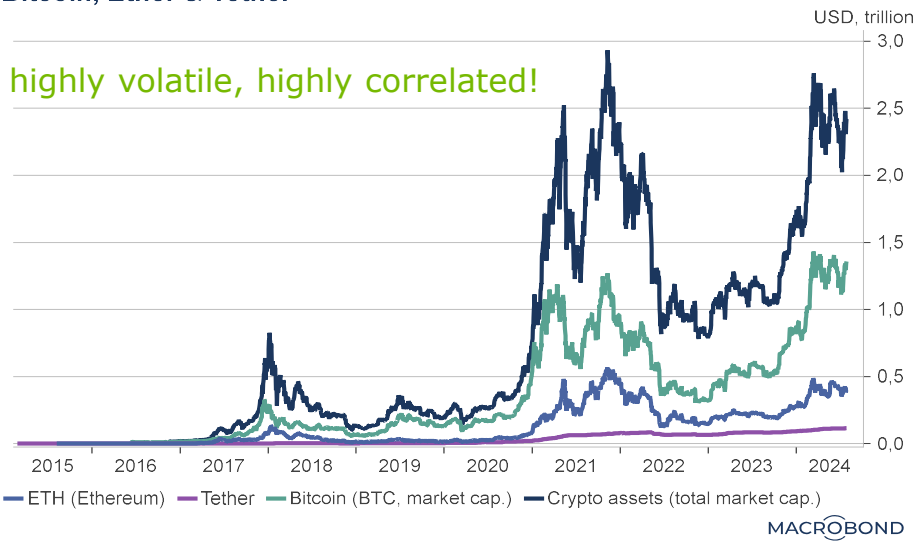
Total Market Capitalization of selected crypto assets: Bitcoin, Ether & Tether



Bitcoin, Ether: **unbacked** Crypto assets;

Tether: **backed** crypto asset

31/7/2024 Heike Joebges Source: Coinmarketcap & Blockchain via Macrobond; accessed on July 25, 2024 ntw.

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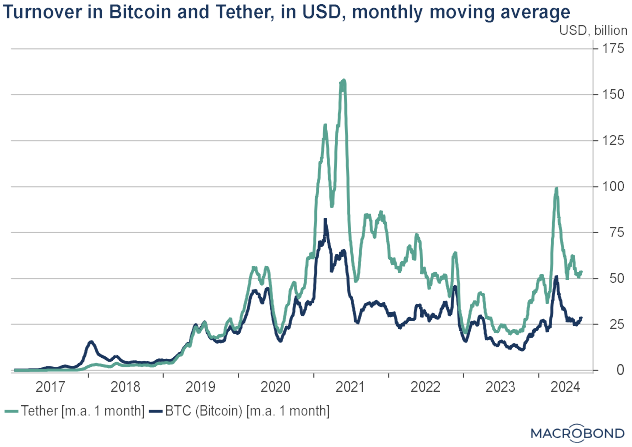
Backed crypto assets: stablecoins more stable in value and growing in relevance

Turnover in Bitcoin and Tether, in USD, monthly moving average



Stablecoins:

- Value often stabilized against Fiat-currencies (officially, mostly USD)
- Value often backed by other crypto assets, but also by fiat money assets
- Turnover above the one of unbacked stablecoins, especially for **Tether**

21. Dez. 2021 Heike Joebges Source: coinmarketcap & Blockchain via Macrobond; accessed on July 25, 2024 ntw.

Smart contracts and decentralized Finance (DeFi)

Pros:

- Transaction cannot be manipulated
- Open to everyone, no censorship
- No intermediaries, no 3rd party
- ➢ Low transaction costs
- ➢ Attractive for international transactions!
- High incentive for financial innovations

Cons:

- No security from hacking, fraud, manipulation,
- losing the key = losing the wallet
- High financial education needed!
- Eases illegal actitivies, tax evasion, capital flight
- Challenge for traditional banking
- Challenge for financial stability
- „Financial Anarchy"? (Smith 2021)

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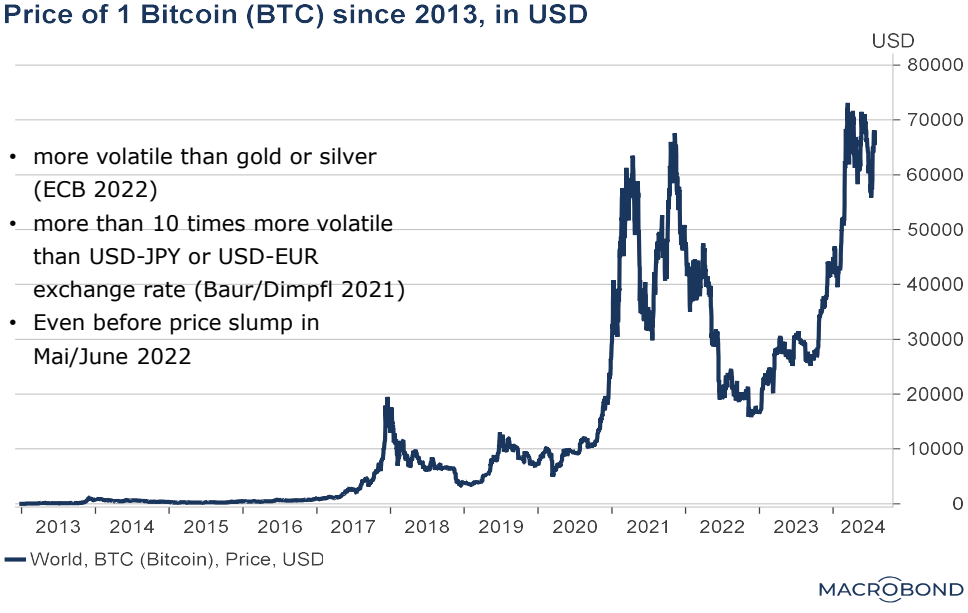
Unbacked crypto assets like Bitcoin are not money (Trotta Vianna 2020), **but rather a risky financial asset** (Baur and Dimpfl 2021)

- **Means of payment** – **not** widely accepted, (not easily divisible)
- **Store of value** – **no**, purchasing power very volatile, => extremely high volatility against traditional fiat & credit money (USD)
- **Unit of account** – **no**, too volatile (=> Figure for price of 1 Bitcoin)

- **Similar issues as with fiat money:**
  - No intrinsic value, trust in value needed
  - But: lacking stabilizing institutions

Price of 1 Bitcoin (BTC) since 2013, in USD

- more volatile than gold or silver (ECB 2022)
- more than 10 times more volatile than USD-JPY or USD-EUR exchange rate (Baur/Dimpfl 2021)
- Even before price slump in Mai/June 2022



 Source: Blockchain via Macrobond; accessed on July 25, 2024

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Backed crypto assets like stablecoins are neither money

"They [stablecoins] present the same kind of risks that we have known for centuries in connection with bank runs"

Janet Yellen at a House Financial Services Committee (e.g. Browne 2022)

- Backing needs to be 100% in highly liquid assets of the currency the crypto asset is pegged to
- Otherwise, stable coins invite self-fulfilling speculation in times of decreasing trust

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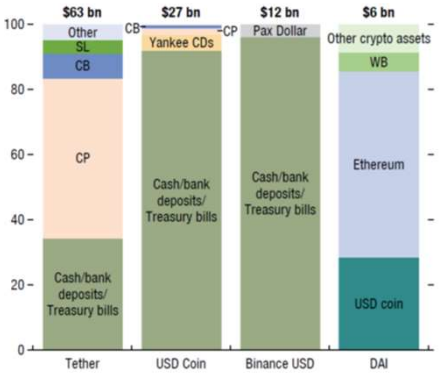
Stablecoins: not risk-free!

Backing differs in quality



Quality of assets?

- No legal right to access assets
- Low transparency (apart from audit report for USD Coin backing)
- Asset quality differs
- **Tether**: fined by CFTC for lying about currency backing in 2021; temporarily lost peg to USD in May 2022

- CFTC = US Commodities Futures Trading Commission

21. Dez. 2021 Heike Joebges Picture source: IMF (2021: 43). htw.

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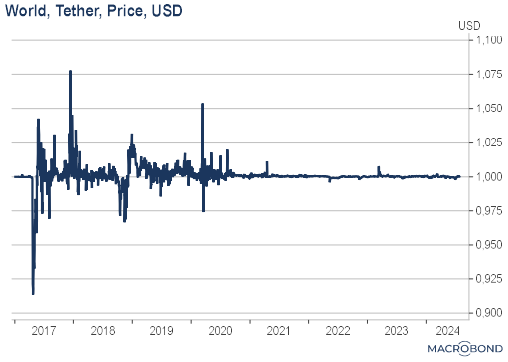
Stablecoins: not always at par to the USD!

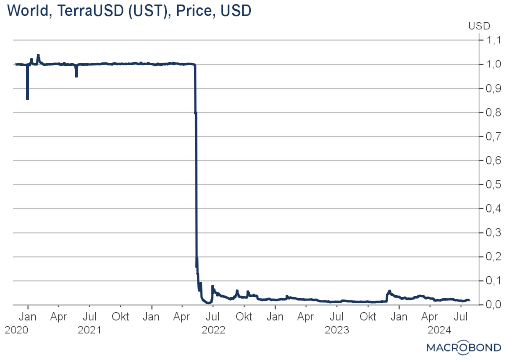
Tether: fined by CFTC for lying about currency backing in 2021; temporarily lost peg to USD in May 2022, but since 2020 quite stable

World, Tether, Price, USD



Terra, a stablecoin backed by another crypto asset, Luna, fell to 1/10 in May 2022;
Luna, its backing, disappeared

World, TerraUSD (UST), Price, USD



31/7/2024 Heike Joebges Sources: Coinmarketcap via Macrobond, accessed on July 25, 2024 htw.

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Crypto asset systems are inherently instable
Is the system really decentralized? (BIS 2023)

⇒ decentralized (proof-of-work) systems: high security at the cost of scalability.
- Financial incentives needed for validators, as building up reputation is not possible
- Consequence: congestions & waiting times; users offer fees for validation

⇒ Centralized (proof-of-stake) systems: Small group of (anonymous) validators

⇒ Cross-chain bridges needed for transfer of coins between systems

⇒ "Oracles" needed for data import from real economy

operated/ developed by a few

⇒ Governance tokens (in the hand of a few) needed due to incomplete algorithms

⇒ Most users lack IT skills, use crypto exchange platforms, run by a few

*Oracle: third party service, crypto exchange application programming interface

Crypto asset systems are inherently instable

"Although crypto operates under the banner of decentralisation, in practice new centralised intermediaries have played a key role in channelling funds into the crypto universe and intermediating within it. … Rather than providing a more resilient financial architecture, crypto displayed the same well known vulnerabilities of traditional finance, but in amplified ways." (BIS 2023: 1)

⇒ Power concentration in the hands of a few AND not regulated, not supervised => attracts illicit behavior, hacks, fraud, mismanagement

⇒ No lolr, no minimum deposit guarantees for clients => contagious effects in crises, high losses for investors

⇒ Procyclical developments

Excursion: shocks to the crypto system

- **Biggest hack** so far: Hack of **Mt. Gox**
  - the largest Bitcoin exchange at that time
  - Handling 70% of Bitcoin transactions in early 2014
  - Hacked already since 2011, bankrupt in 2014
  - lost 744,408 Bitcoin, worth approximately $350 million at that time
- **Biggest fraud** so far: **FTX** cryptocurrency exchange
  - Second/Third-largest crypto exchange at that time, handling about assets at billions of US$; more than 100,000 creditors
  - Bankruptcy in Nov. 2022
  - civil and criminal charges against Sam Bankman-Fried & Management by US gov for misappropriating over $8 billion in customer deposits

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Crypto assets pose systemic risks to the real economy I

High price volatility poses threat to financial institutions

- Direct: changes in values of crypto assets or liabilities
- Indirect: households' or companies' repayment abilities depend on crypto assets value
- Plus: high interlinkages with other financial institutions via crypto assets

Commercial bank

Assets	Liabilities
Reserves at the central bank	Loans from central bank
Government Bonds	Deposits
Loans to firms and households	
Other assets e.g. crypto assets	other liabilities in crypto assets

Crypto assets pose systemic risks to the real economy II

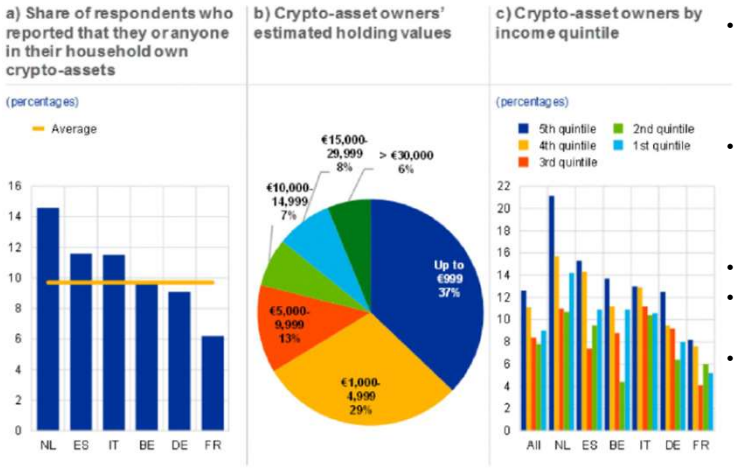
- More and more financial services in crypto assets offered by traditional financial institutions as well as by decentralized DeFI institutions
- Increasing correlation of crypto assets with traditional risky financial assets
- Increasing leverage (ECB 2022)
- Yet, hardly any regulation nor any stabilizing institutions
- New financial assets increase the risk of systemic failures, as risks may not be correctly assessed
- Even though until now: NO relevant FINANCING OF REAL ACTIVITIES (BIS 2023)

Crypto assets pose systemic risks to the real economy III

Crypto assets by construction no alternative to traditional money:

- **Deflationary** effect of Bitcoin:
  - limitation of Bitcoins to a maximum => increasing value of Bitcoins would decrease the price level of goods and services
- **No elastic money supply:**
  - individual emitting institutions of crypto assets follow individual profit maximizing; instead of an elastic macroeconomic liquidity supply
  - no lender-of-last resort function

Potential effects on consumption? IV



Source: ECB Consumer Expectation Survey (CES).

- Germany: Users are „young, male, well-educated and well-off" (Steinmetz et al. 2021)
- Yet, new surveys point to U-shaped curve regarding usage by income levels for Europe;
- Similar findings for US
- 70% of exchanges in Offshore centers
- Relevant share of users from Emerging Market Economies (IMF 2021: 50)

Crypto assets pose systemic risks to the real economy V

- Is neither inclusive, nor a source for financing real investment
- Oligopolistic, anonymous structure invites hacks, fraud, manipulation, market power abuse
- Eases capital flight
- Eases tax evasion
- Decreases the effect of monetary policy
- … especially for small developing countries with unstable currencies and inflation issues

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Conclusions I

- The traditional financial system has its flaws: it is characterized by repeated crises, not fully inclusive, international transactions are costly…
- Regulation mainly focuses on commercial banks, less on other financial institutions, and is often not up to date with financial innovations
- Yet, crypto assets are not a solution, but show even worse problems of oligopolistic structures with market power misuse, manipulation, fraud, hacks
- Crypto assets are rather an increasingly relevant new source for instability
- Decentralized finance undermines the effect of monetary policy, especially in developing countries with unstable currencies that lack regulatory power

Conclusions II

- Needed: increased and internationally coordinated regulation & supervision of the crypto system
- plus a well-functioning (traditional) financial system
  - Supervised & regulated in an internationally coordinated way, closing loopholes
  - inclusive, quick & affordable not just for domestic transactions (see e.g. PIX plus access to bank credits in Brazil), but also for international transactions

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Thank you for your attention!

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