DeFi ecosystem: risks and opportunities

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Disclaimer: The views are my own and not necessarily the views of the BIS.

Crypto (DeFi/CeFi) vs traditional financial system (TradFi)

Function	Service	Crypto financial system: Decentralised finance (DeFi)	Crypto financial system: Centralised finance (CeFi)	Traditional finance
Trading	Funds transfer	DeFi stablecoins (DAI)	CeFi stablecoins (USDT, USDC)	Traditional payment platforms
	Asset trading	Crypto asset DEX (Uniswap)	Crypto CEX (Binance, Coinbase)	Exchanges and OTC brokers
	Derivatives trading	Crypto derivatives DEX (Synthetix, dYdX)		
Lending	Secured lending	Crypto decentralised lending platforms (Aave, Compound)	Crypto centralised lending platforms (BlockFi, Celsius)	Broker-dealers active in repo and securities lending
	Unsecured lending	Crypto credit delegation (Aave)	Crypto banks (Silvergate)	Commercial banks and non-bank lenders
Investing	Investment vehicles	Crypto decentralised portfolios (yearn, Convex)	Crypto funds (Grayscale, Galaxy)	Investment funds

CEX = centralised exchanges; DEX = decentralised exchanges; OTC = over-the-counter; USDC = USD Coin; USDT = Tether.

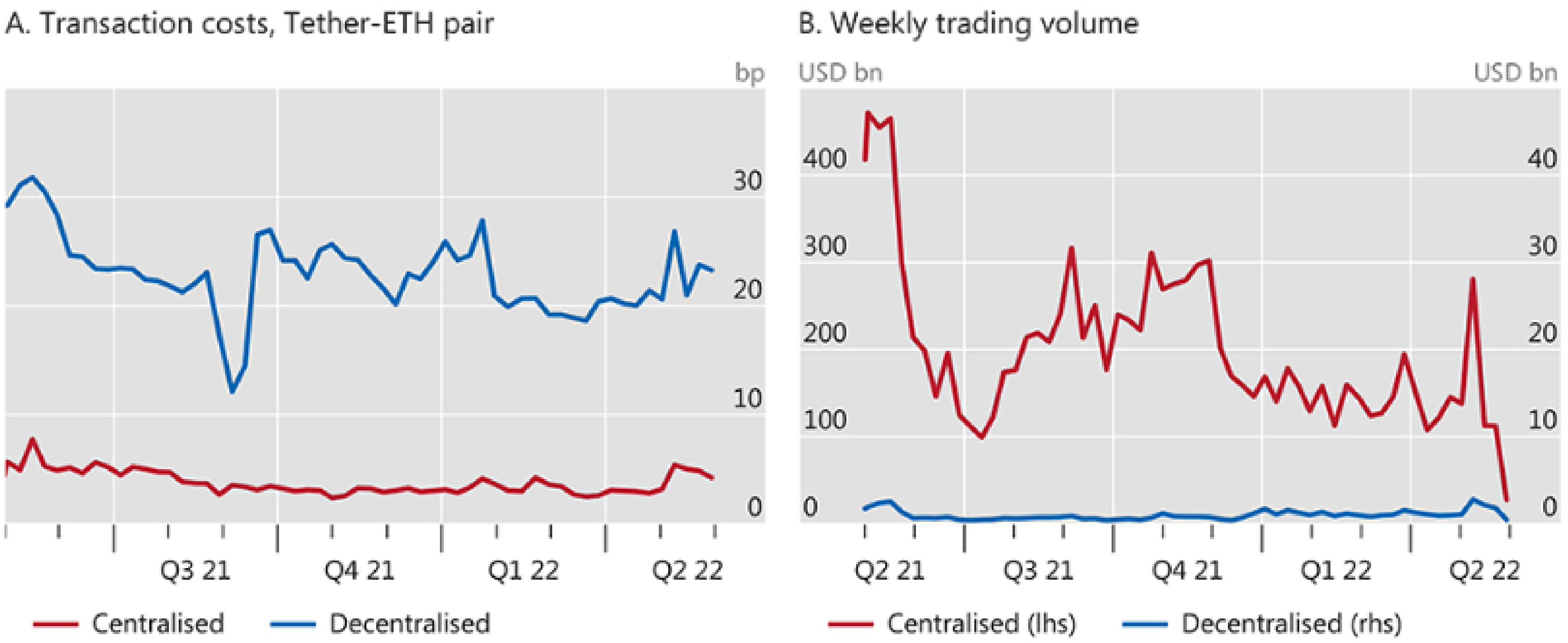
Crypto trading: centralised vs decentralised exchanges

- Centralised exchanges operate similarly as their peers in TradFi
  - Maintain **off-chain records** of traders' outstanding orders (ie limit order books)
  - But there is often **murky segregation** between exchanges and the associated trading firms
    - Eg **FTX** vs Alameda
    - CFTC's investigation into **Binance** over insider trading (Bloomberg, 17 Sep 2022)
    - CFTC sued **Gemini** over misleading statements and bespoke fee rebates (FT, 2 June 2022)

- Decentralised exchanges work in substantially different ways
  - Match counterparties through **on-chain automated market-maker (AMM) protocols**
  - Traders can become **liquidity providers** by making their crypto-assets available in liquidity pools (earn fee and benefit from pool price appreciation)
  - **Traders demanding liquidity** can buy or sell crypto-assets in the pool
  - **Prices** are set based on quantities demanded and supplied to the pool

Centralised vs Decentralised exchanges: trading costs and volumes

Centralised and decentralised exchanges: costs and volumes[1] Graph 5

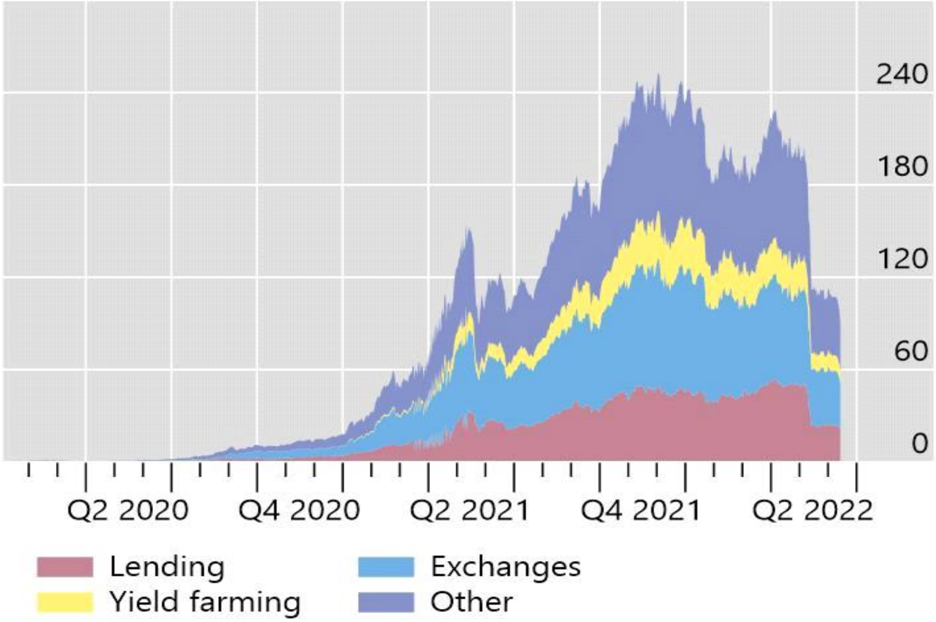


[1] See technical annex for details.

Sources: Aramonte et al (2021); Binance; Coinbase; CryptoCompare; Uniswap; BIS.

DeFi lending has grown rapidly, as high returns attract investors

Total value locked (TVL) in DeFi (USD bn)

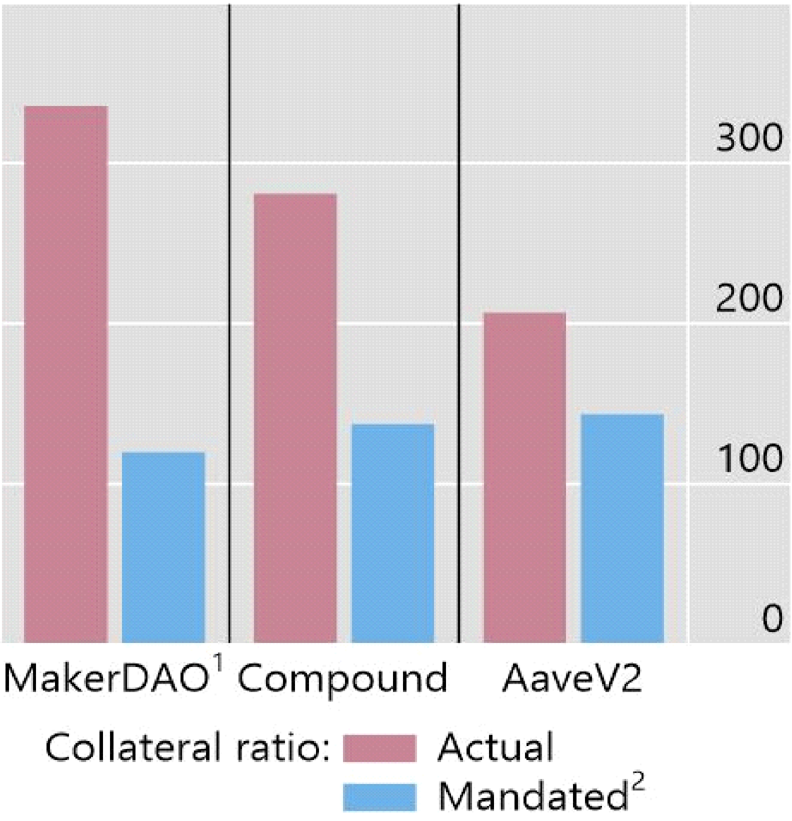


Lending rates in DeFi platforms (%)

- TVL in DeFi lending protocols peaked at $50 billion in early 2022
- But recent events have put a stop to the rapid ascent of DeFi lending
- Lenders are attracted by high interest rates
- Borrowers use DeFi lending to gain leveraged exposure to cryptoassets

Key feature of DeFi lending – reliance on crypto collateral

Overcollateralisation in DeFi lending

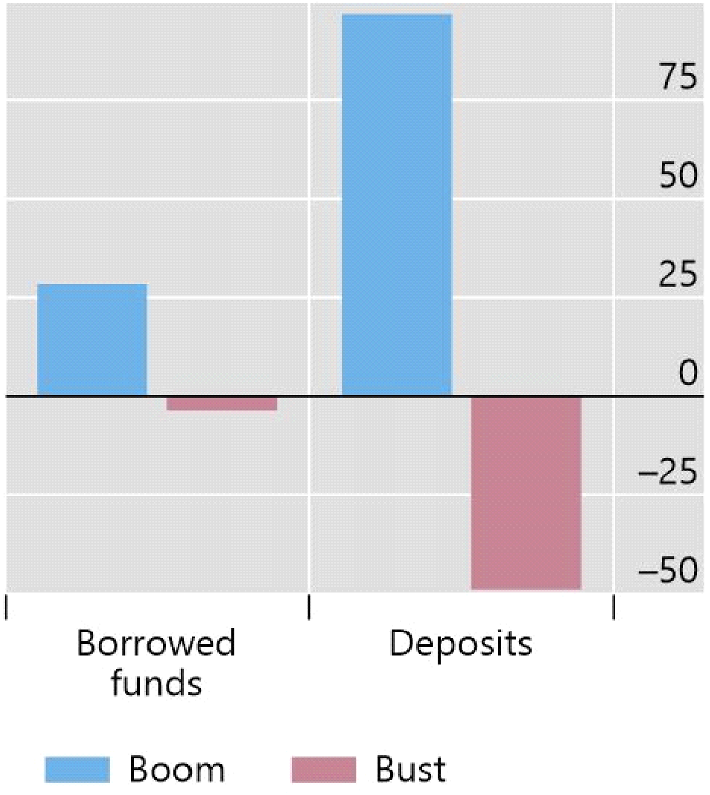


- DeFi lending does **not** involve intermediaries such as banks
- Activity takes place on **smart contracts**, which administer loans following pre-specified rules
  - **Depositors** stake their cryptos in liquidity pools and earn a deposit rate
  - **Borrowers** pledge crypto collaterals and borrow other desired cryptos
- Due to pseudo-anonimy, DeFi lending **cannot screen** borrowers based on identity
- Instead, it relies on **overcollateralisation** to align the incentives of borrowers and depositors

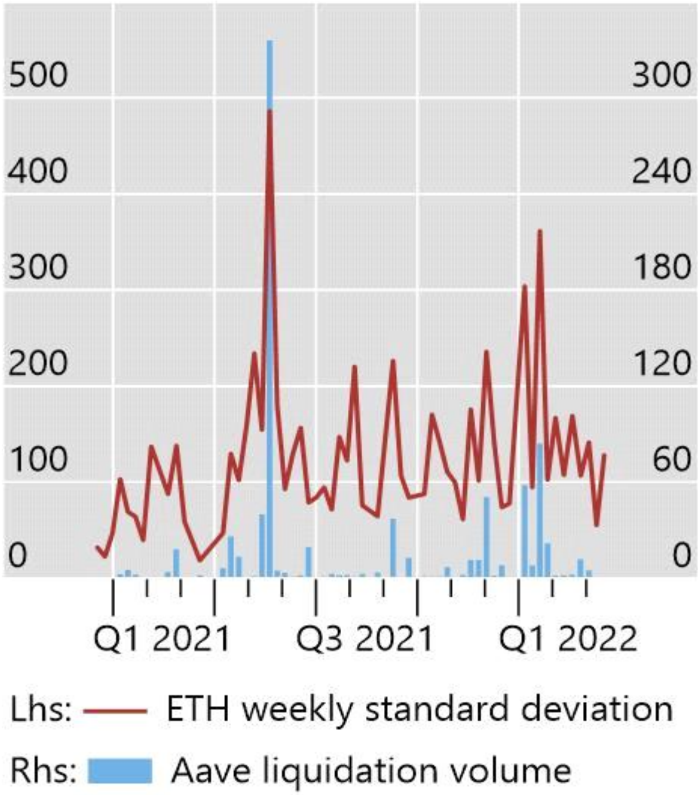
DeFi lending is by design procyclical, amplifying boom-bust cycles

Ether (ETH) price and boom-bust cycle

Procyclicality in borrowing and deposit



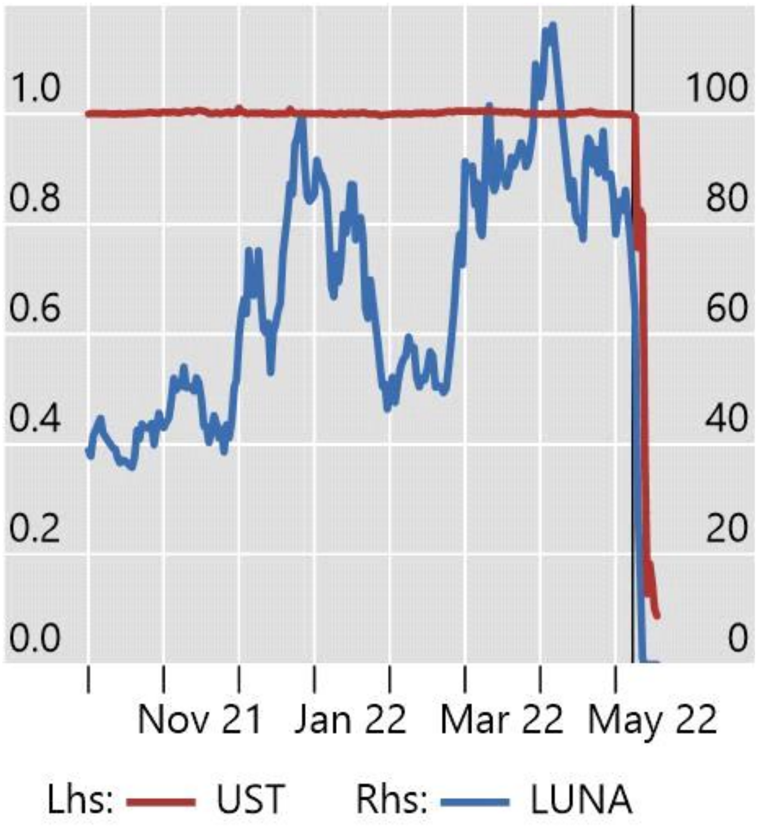
Liquidations peak when volatility spikes



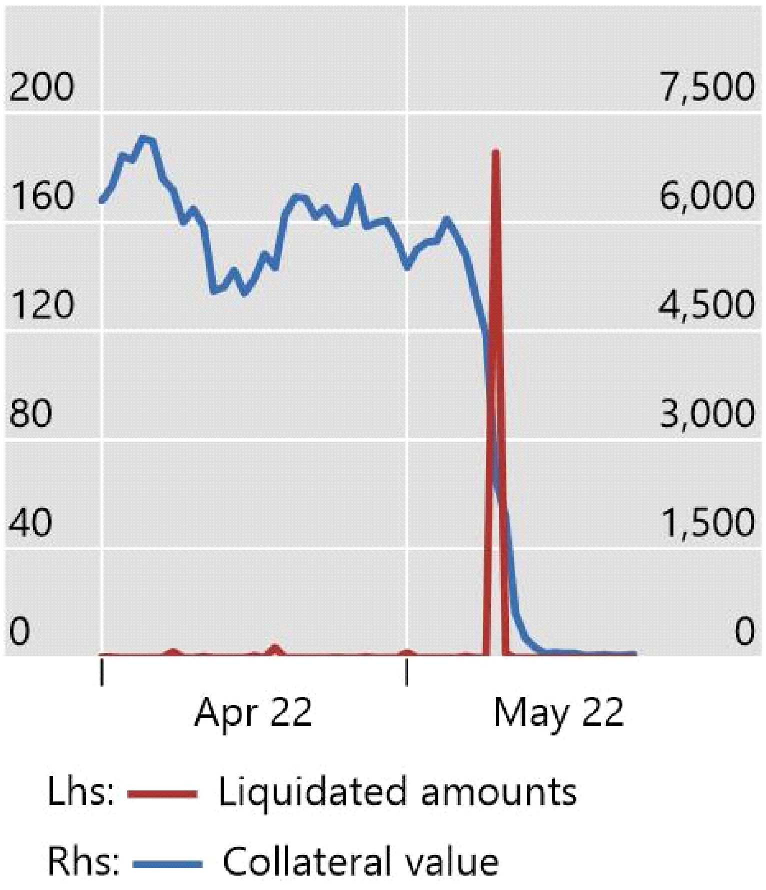
- **Procyclicality**: the amount of lending that can take place depends on the total value of assets eligible as collateral

Interconnectedness can exacerbate procyclicality, leading to run

UST depeg



Liquidation spiked



Platform run

Financial inclusion or exclusion?

- DeFi purports to improve **financial inclusion**
- But the need for collateral only allows the **asset-rich** to have access to financial services
- Borrowers are required to own more assets than they wish to borrow – **overcollateralisation**
- In contrast, **fintech** and **big tech** lenders use digital info about borrowers -> credit scores
- The use of **real identities** allows for trust and relationship building -> effective screening

"BUT IF I HAD ENOUGH COLLATERAL TO COVER THE AMOUNT OF THE LOAN, I WOULDN'T NEED THE LOAN IN THE FIRST PLACE!"

Possible way ahead

- DeFi brings genuine innovation – **smart contracts** and **composability**
- This can help bring down the costs of financial intermediation
- Harnessing the benefits of these innovative elements will require substantial changes
    - **Large-scale tokenisation of real-world assets** → Reliable oracles
    - **The use of real names**, and ultimately proper **regulations**
    - Preserving user **privacy**
- **A hybrid between properly regulated CeFi and DeFi**