

Financial Stability Risks from Crypto-Assets

Costas Stephanou, Head of Financial Stability Analysis, Financial Stability Board

Cyprus Economic Society presentation

12 May 2022



Key message and structure of presentation

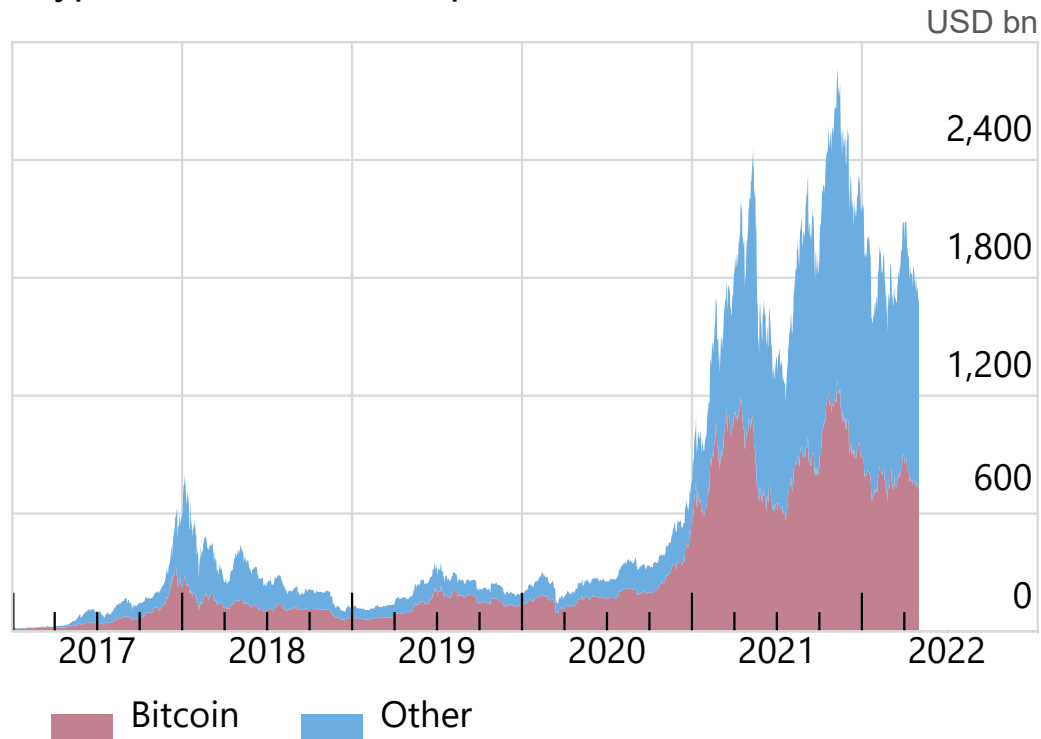
- Conclusion of the February 2022 FSB report to the G20 on Assessment of Risks to Financial Stability from Crypto-assets
 - Crypto-asset markets are fast evolving and could reach a point where they represent a threat to global financial stability due to their scale, structural vulnerabilities and increasing interconnectedness with the traditional financial system. The rapid evolution and international nature of these markets also raise the potential for regulatory gaps, fragmentation or arbitrage. Although the extent and nature of use of crypto-assets varies somewhat across jurisdictions, financial stability risks could rapidly escalate, underscoring the need for timely and pre-emptive evaluation of possible policy responses.
- This presentation
 - Defines crypto-assets and provides an overview of their main characteristics and evolution
 - Describes financial stability risks associated with crypto-assets

Crypto-assets

- A digital representation of value or contractual rights that can be transferred, stored or traded electronically, and which typically use cryptography and distributed ledger or similar technology (DLT)
 - DLT allows simultaneous access, validation, and record updating in a secure and unchangeable way across a network spread across multiple entities or locations (as opposed to a central ledger, where a single entity records transactions and ownership). A blockchain is a form of distributed ledger in which details of transactions are held in the ledger in the form of blocks of information.
 - Cryptography is the conversion of data into private code using encryption algorithms, typically for transmission over a public network
- Crypto-assets have grown rapidly in recent years, and there is by now a broad range of products (17,000+) in circulation
 - Examples include unbacked crypto-assets, stablecoins, privacy coins, governance tokens, utility tokens and non-fungible tokens
- Adoption is driven by a range of factors

Crypto-assets

Crypto-asset market capitalisation



Source: Coin Dance.

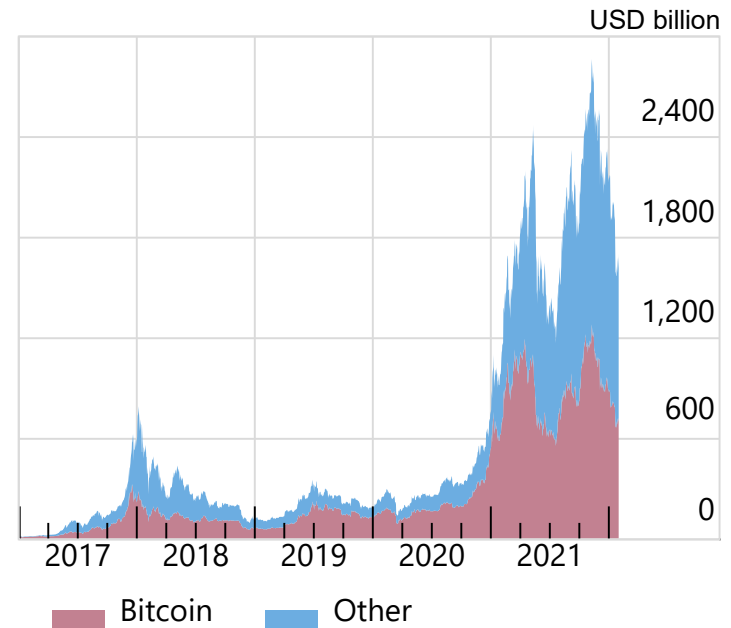
Unbacked crypto-assets

- Crypto-assets (e.g. Bitcoin or Ether) that are neither tokenised traditional assets nor stablecoins. They are non-replicable strings of computer code that can be owned and transferred without intermediaries, and have no underlying assets.
- Represent the vast majority of crypto-asset market capitalisation and activity
- Establish no claim on future income streams or collateral, meaning they have no intrinsic value (their value is not directly tied to the technology)
- These characteristics make them highly volatile and vulnerable to major price corrections
- Most frequent use is speculative investments (spot or derivatives markets), mostly through crypto-trading platforms

Significant growth of unbacked crypto in 2021 has increased its potential impact

- November 2021 peak at estimated market capitalisation of unbacked crypto-asset markets of \$2.6 trillion was about 3.5 times higher than at the start of 2021.
- An increasing share of crypto-assets is apparently held by retail investors, although overall ownership is still relatively concentrated.
- Announcements by individual firms and regulatory authorities caused large price moves.

Crypto-asset market capitalisation



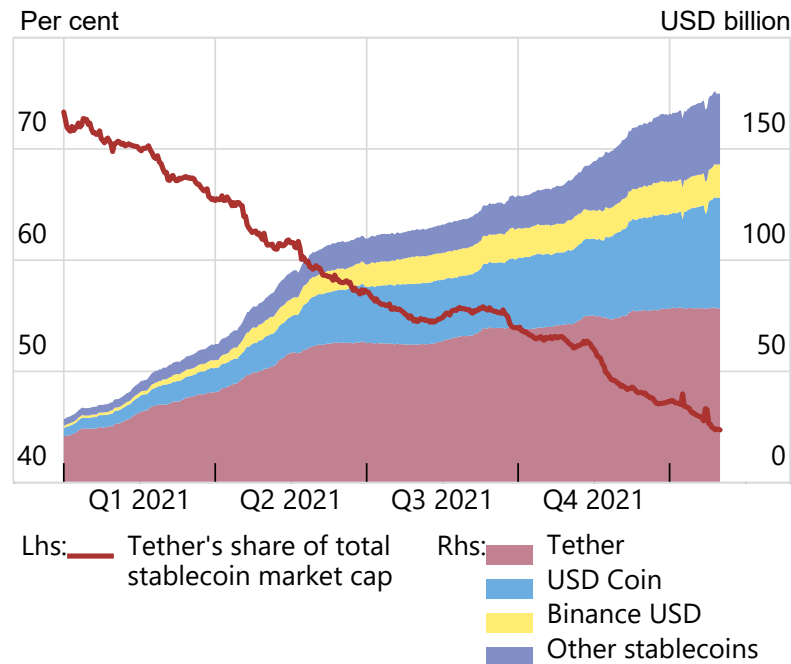
Source: Coin Dance.

Stablecoins

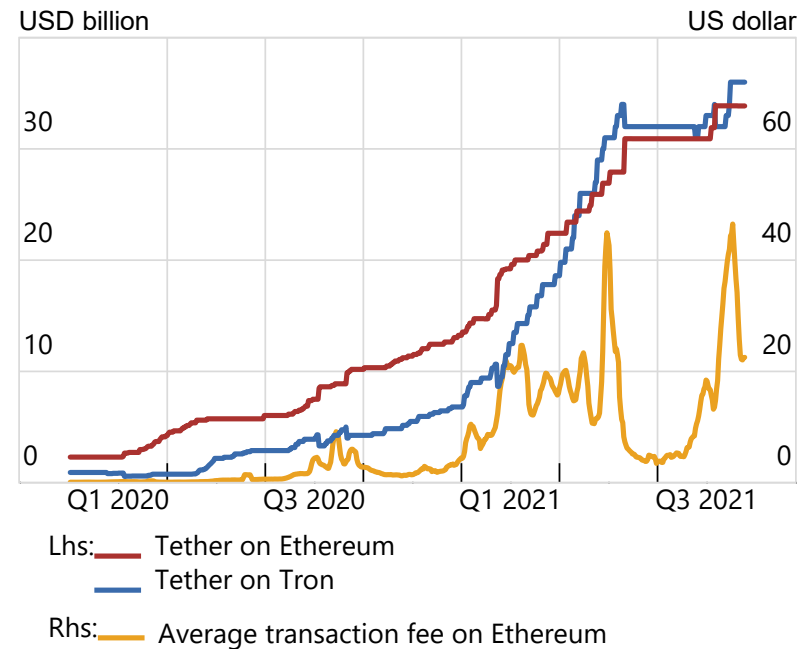
- A crypto-asset that aims to maintain a stable value relative to a specified asset (typically US dollars), or a pool or basket of assets
- Can provide relative price stability compared to the high volatility of unbacked crypto-assets, facilitating their use in payments
- Generally created, and distributed through trading platforms, in exchange for fiat currency. Around 75% of crypto-asset trading on centralised exchanges involves a stablecoin.
- Various types: fiat-backed (e.g. Tether, USD Coin), crypto-backed (e.g. DAI), commodity-backed, and algorithmic (e.g. Terra USD)
- Main uses:
 - acting as a bridge between fiat currencies and other crypto-assets
 - serving as collateral in crypto-asset derivative transactions
 - facilitating trading/lending/borrowing and acting as collateral in DeFi

Market capitalisation of selected stablecoins

Market capitalisation of stablecoins



Tether market capitalisation by blockchain and average transaction fees on Ethereum



Sources: ECB, "The expanding functions and uses of stablecoins", *Financial Stability Review*, November 2021; CoinGecko; FSB calculations.

Decentralised finance (DeFi)

- A set of alternative financial markets, products and systems that operate using crypto-assets and 'smart contracts' (software) built using DLT, purportedly without the need for intermediaries
 - This includes lending, investment/trading/custody, payments and insurance of crypto-assets
 - Transactions are typically (over-)collateralised by crypto-assets
- Distinguishing features
 - Openness
 - Trustless
 - Permissionless
 - (alleged) Decentralised ownership and governance structure

Decentralised Finance (DeFi)

Total value of assets locked in DeFi transactions



Source: Coin Dance.

Risk assessment methodology

- The vulnerabilities in crypto-asset markets – relating to leverage, liquidity/maturity mismatch operational/technological fragilities and interconnectedness – are similar to those in traditional finance
- 2018 FSB report provides framework for transmission channels through which crypto-asset vulnerabilities might affect financial stability:
 - Financial sector exposures to crypto-assets
 - Wealth effects
 - Confidence effects
 - Extent of crypto-assets' use in payments and settlements

Data gaps and monitoring challenges

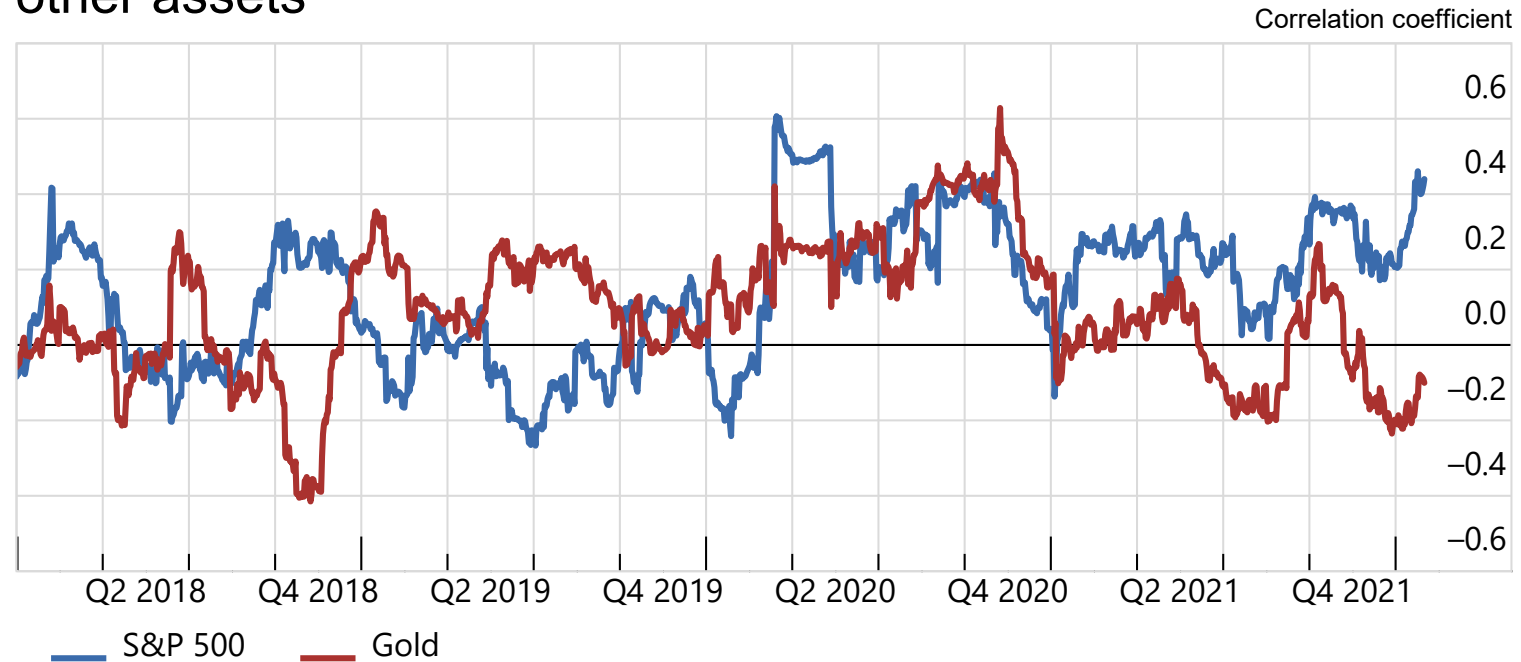
- It is challenging to assess inflection points given the rapid evolution of crypto-asset markets and the significant data gaps that impede authorities' risk assessments
 - These gaps stem, in part, from the fact that participants, products, platforms and markets often fall outside the regulatory perimeter
- Distributed ledger technology's transaction data is difficult to aggregate and analyse, especially "off-chain" transactions that are not reported, or transactions reported through complex protocols and smart contracts
- Anonymous identity of users of public blockchains makes it difficult to assess interconnectedness within the crypto-asset ecosystem and with the broader financial system
- Sources differ in terms of methodologies, data coverage, and access to and quality of primary data, largely due to a lack of standardised reporting requirements and regulation or compliance with regulation

Key assessment findings

- Institutional involvement in crypto-asset markets has grown over the last year, albeit from a low base
- There is also rapidly growing retail investor adoption
- Direct connections between crypto-assets and systemically important financial institutions and core financial markets, while growing rapidly, are still limited
- Episodes of price volatility have, so far, been contained within crypto-asset markets and have not spilled over to financial markets and infrastructures
- Currently crypto-assets are not widely used in critical financial services (including payments)

Correlations between crypto-assets and equities have grown since early 2020

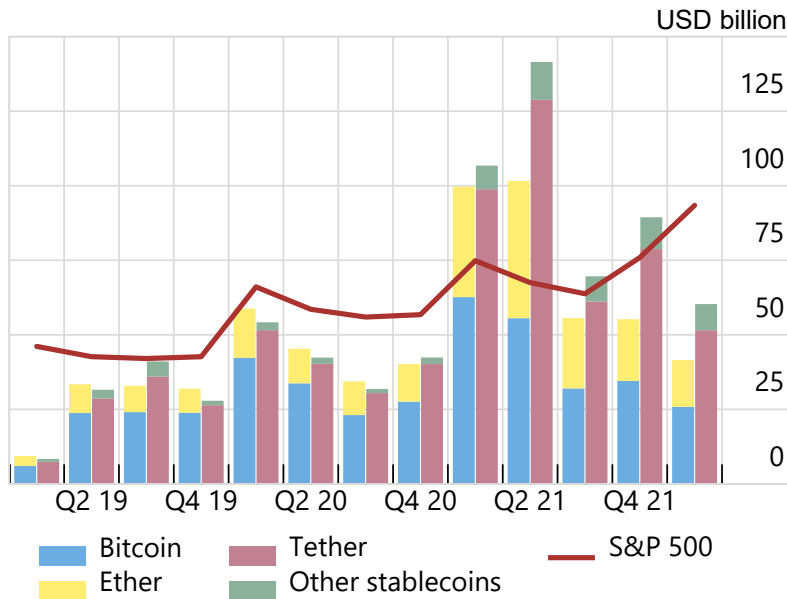
60-day moving correlations of changes in the prices of bitcoin and other assets



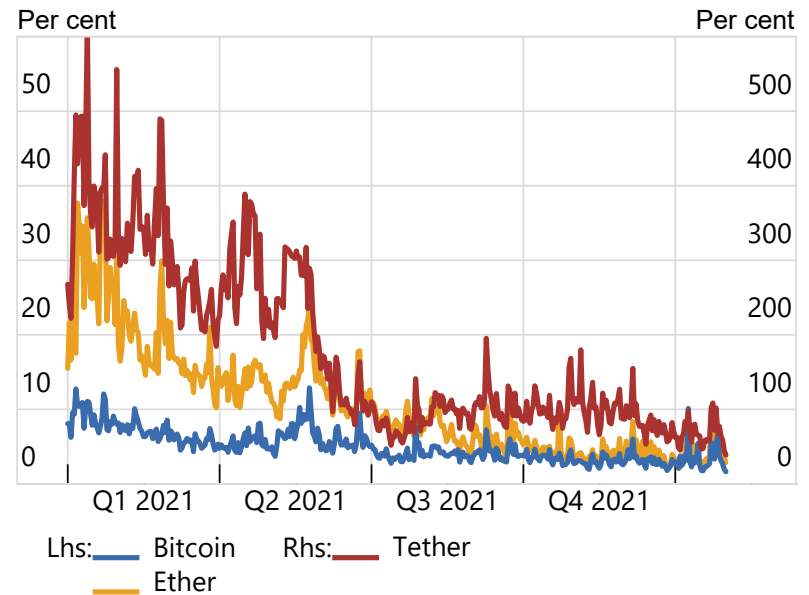
Sources: Bloomberg, CoinGecko; FSB calculations.

Trading volumes of crypto-assets

Average daily trading volumes of selected crypto-assets



Daily turnover of Tether, Bitcoin and Ether¹

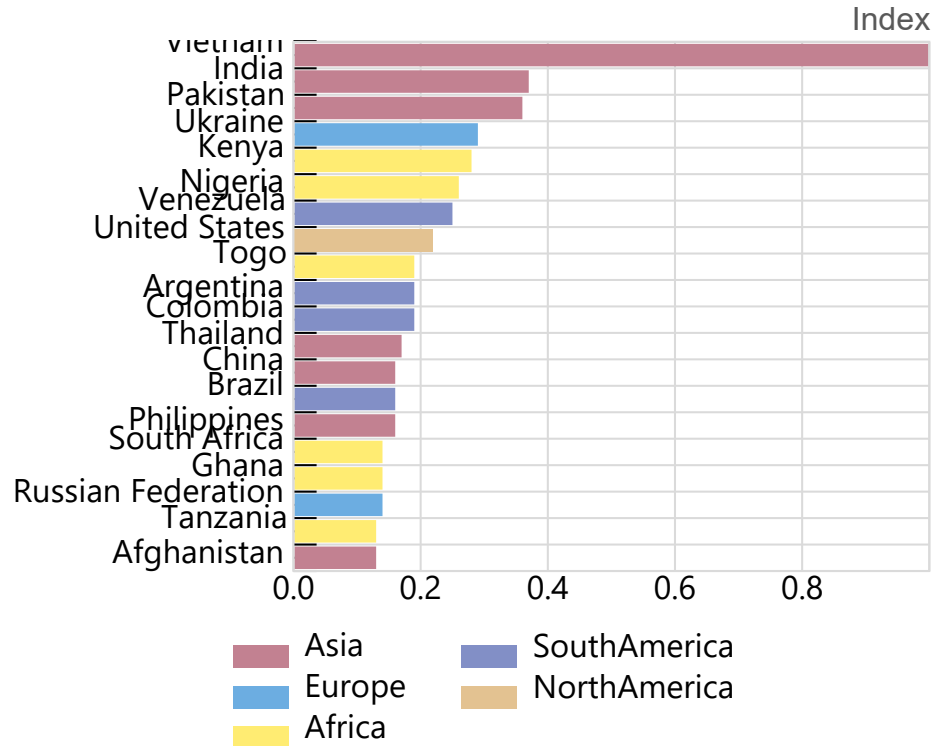


¹ Daily turnover as daily trading volume divided by market capitalisation.

Sources: CoinGecko; FSB calculations.

Crypto adoption is higher in emerging markets

Crypto-adoption Index as of 2021 (Chainalysis)



Source: Chainalysis.

Specific stablecoin concerns

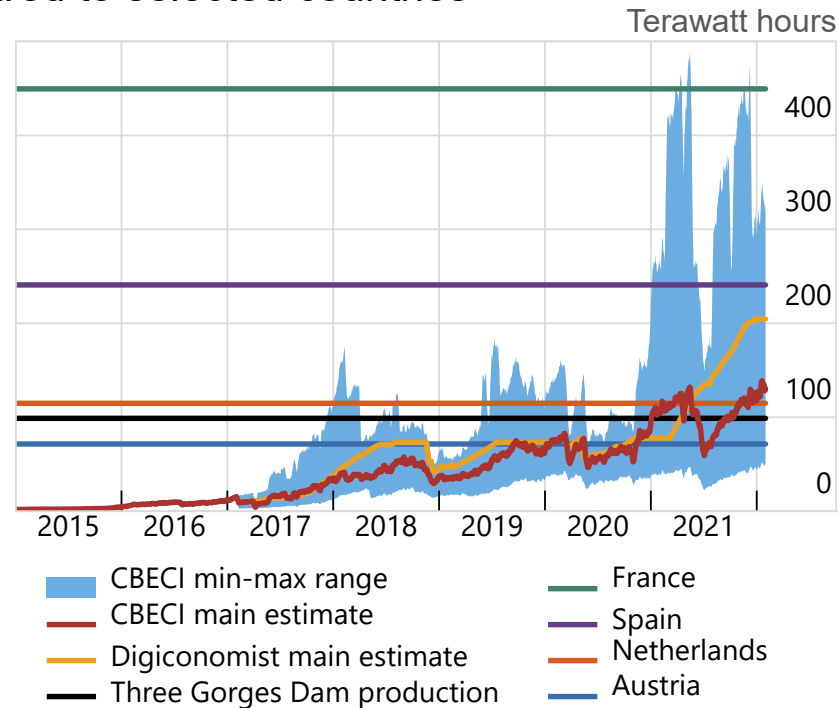
- Stablecoins can have a direct connection to the financial system through their reserve assets
- But stablecoin issuers are not subject to a consistent set of standards regarding the reserve assets backing the stablecoin, and there is insufficient disclosure about the adequacy and composition of reserves
- Were a major stablecoin to fail, this could spill over to short-term funding markets and lead to fire sales of those assets
 - Analogy to liquidity mismatches and incentives to run for money market funds, which can ‘break the buck’
 - This would have knock-on effects on the entire crypto-asset sector
- Algorithmic stablecoins are prone to death spirals (cf. Terra)
- So-called ‘global stablecoins’ would pose risks to financial stability that exceed those of existing stablecoins (cf. Libra)
 - These risks are even bigger for emerging markets

Specific DeFi concerns

- Though DeFi projects claim to be decentralised, DeFi applications and products often exist along a spectrum of centralisation
 - Who makes decisions within different protocols? And who is responsible if something goes wrong?
 - Over-collateralisation and automatic triggers in smart contracts on DeFi platforms substitute for checking the identity of users and credit risk assessment of borrowers, but raise new challenges
- The sector has already seen numerous operational and cybersecurity incidents, and failures of governance
- More generally, the relatively small number of crypto-asset trading platforms that aggregate multiple types of services, some of which operate outside of regulatory perimeters, raise concentration risks

Crypto-assets have a growing climate footprint

Estimated annualised global bitcoin electricity consumption compared to selected countries¹



CBECI = Cambridge Bitcoin Electricity Consumption Index.

¹ Horizontal lines denote annual electricity consumption of countries in 2020 and the annual electricity production capacity of the Three Gorges Dam, which is the world's largest power station in terms of installed capacity.

Sources: Cambridge Centre for Alternative Finance, Digiconomist, International Energy Agency; ECB.

Concluding thoughts

- The technology underpinning crypto-assets could bring a number of benefits including lower transaction costs, higher payment system efficiency and transparency, and more choice for users...
- ... but these need to be undertaken safely and accompanied by effective public policy frameworks that mitigate risks and maintain broader trust and integrity in the financial system
 - Risks relate to financial stability, consumer/investor protection, market integrity, money laundering and terrorist financing
 - These risks are likely to increase as crypto-asset markets grow, and as links with the traditional financial system increase
- There is therefore a need for ongoing monitoring of developments...
 - Lots of work needed to address data gaps
- ... and the adoption of a comprehensive regulatory framework
 - Given the global nature of cryptoassets and associated markets, international co-operation among regulatory authorities is essential